THE IRON TRADE REVIEW

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Orders for Finished Materials Are Piling Up

And Deliveries Are Further Extended—Changes in Lake Superior Ore Contracts—Canada Takes Pig Iron

Orders for finished materials are coming to steel companies more rapidly than desired by manufacturers, who find that their deliveries are constantly being extended. Some extraordinary methods are being adopted and experiments made in order to meet urgent demands. An importing house in New York City has investigated the possibility of importing steel beams from Germany, and finds that this material cannot be depended upon except for small lots for quick shipment at high prices. German mills are not anxious to cater to American trade under present conditions of world-wide prosperity. The Canadian Car & Foundry Co. has purchased 40,000 tons of billets and 50,000 tons of plates in this country. Of the billet tonnage, 20,000 went to a Buffalo maker.

Iron Ore

Sales of Lake Superior ores to steel companies have been very heavy, but merchant furnaces are proceeding deliberately and few orders have been placed for non-Bessemer ores. Considerable difficulty was experienced last year in selling some of the non-Bessemer ores and it has been decided to eliminate the premiums which have been obtained for a number of years on such ores of 53 per cent and above in iron in the natural state. Another important change in the contracts which are now being written provides that furnaces having ore on lower lake docks at the taxing time in April must pay the taxes. This change results from a controversy of long standing between the ore interests and taxation officials as to how ore on docks should be taxed. The outlook for heavy sales of Lake Superior ores to eastern consumers is very favorable and it seems likely that a new record for the consumption of lake ores in eastern territory will be made in 1913. This is due to expected increase in operations of eastern furnaces, to high ocean freight rates and to the unusually strong demand abroad for foreign ores. With the new schedule of prices on Lake Superior ores, there is no trans-Atlantic ore which promises to be an active competitor. Prices of Port Henry ore for 1913 delivery have been fixed on the basis of the 1911 schedule, which is an advance of 50 cents per ton.

Pig Iron

The Canadian Car & Foundry Co. has purchased 20,000 tons of basic, malleable and foundry from Buffalo makers at from $17.50 to $18, furnace. An interesting development in the eastern pig iron market is the appearance of a Pennsylvania steel company as a buyer of basic to offset shortage of its own supply. This company took 5,000 tons, divided between eastern and western makers. The competition of a middle western seller forced eastern makers to cut the original price. The demand for standard mill forge continues active in the east. One company took 10,000 tons for shipment over the next few months at $17.50 to $17.75, delivered. One maker of standard forge has recently sold 15,000 to 20,000 tons in the eastern market. Sales at Pittsburgh include 10,000 tons of Bessemer at $17.25, valley, and 7,500 tons of malleable at $17 and $17.25, valley. In the south, while some sales are being made at high prices, persistent reports are current of concessions being made by some of the minor producers. Some melters of pig iron are asking furnaces to anticipate shipments, but many makers of pig iron are finding it difficult to keep up with their delivery contracts.

Railroad Buying

Railroad buying has been the most important factor in the Chicago market during the past week and orders which have either been closed or will be within a few days aggregate 30,000 cars. In other sections, important inquiries for cars are pending, but definite announcements of purchases are not numerous. The Pennsylvania railroad has formally distributed a supplemental rail order of from 60,000 to 80,000 tons among different mills for next year's delivery, bringing the total purchase for that period to approximately 200,000 tons. Corporation mills and those of the Pennsylvania, Cambria, Lackawanna and Bethlehem Steel companies participated in the distribution. The Argentine government is inquiring for 12,000 tons of rails for roads in that country. The receiver of the Wheeling & Lake Erie railroad has asked permission of the court to purchase 3,000 cars and 20 locomotives. It is expected that the orders will be placed at an early date. The New York Central Lines have taken bids for a number of bridges aggregating 2,400 tons.

Old Material

A stock of old material, amounting to from 45,000 to 50,000 tons of all grades, which has been accumulating for several years at Albany, N. Y., will be sold Dec. 3. The spot market shows considerable irregularity, being stronger in some centers and weaker in others.

PITTSBURGH

Mills Avoid Taking New Business

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Demand for nearly all lines of finished iron and steel products continues heavy, and many of the mills are endeavoring to avoid booking further tonnages, because of the fact it will be difficult to deliver material until after July 1. The leading interest continues to maintain the 1.45c quotation on steel plates and structural shapes. Some of the independent manufacturers are quoting these products at 1.60c, for forward delivery.

The pig iron market, after several weeks of unusual activity, has become comparatively quiet, and it is not believed heavy buying will be renewed until December. Many in the trade believe that prevailing quotations will remain stationary the remainder of the year, and effort is being made to prevent further advances.

The coke market shows indications of further price advances. Many sellers are refusing to quote below $3.50, ovens, on contract furnace coke, but consumers are declining to pay above $3.25, ovens, except when special fuel is involved.

The Riter-Conley Mfg. Co. has taken a contract for about 1,200 tons of riveted steel plates for a pipe line project in New York, and other fabricators have been receiving rather good orders the last week or 10 days. Fabricating shops are not so badly congested as they were a month ago.

Pig Iron.—The pig iron market is comparatively quiet after two or three weeks of decided activity, during which consumers in this and adjacent districts bought unusually heavy tonnages for shipment this year and first half of 1913. Not much iron is involved in pending inquiry. The Pittsburgh Steel Co. is still in the market for 20,000 tons of basic for shipment this year and has not covered requirements for the first half of next year.

Immediately following the Jones & Laughlin Steel Co.'s purchase of 42,000 tons of Bessemer, another interest in this city closed negotiations for two 10,000-ton lots of the same grade at $17.25, to be shipped the first six months of 1913. A sale of 7,500 tons of standard malleable at $17 and $17.25, for shipment first and second quarter, also is noted. We also are able to report a 1,000-ton sale of malleable at $17.25, for similar shipment. About 10 days ago, it was advised today, one of the independent steel companies in this city sold 10,000 tons of basic to one of the leading brokers in this city, at $16.50, valley, which is now considered the absolute minimum of this grade. Dealers are having no trouble in obtaining $17.50, valley, for No. 2 foundry and malleable when rather heavy tonnages are involved.

The Struthers Furnace Co.'s stack near Youngstown, which has been running on basic, has blown out for repairs, and it is advised that the Midland furnace of the Pittsburgh Crucible Steel Co. will go out Jan. 1, for repairs, after running about six years on one lining. The Hubbard furnace of the Andrews & Hitchcock Iron Co., Youngstown, which went out a couple of months ago, will resume operations about Dec. 1. The Fannie furnace of M. A. Hanna & Co., Cleveland, at West Middlesex, Pa., which has been idle about two years, will begin making Bessemer the first of the year, and Ella furnace, of Pickands, Mather & Co., at West Middlesex, will start making Bessemer at that time. Quotations are as follows:

(Remainder of Year and First Quarter.)

Bessemer, valley	$17.25
Bessemer, Pittsburgh	18.15
Basic, valley	16.50
Basic, Pittsburgh	17.40
No. 2 foundry, valley	17.50
No. 2 foundry, Pittsburgh	18.40
Malleable, valley	17.25 to 17.50
Malleable, Pittsburgh	18.15 to 18.40
Gray forge, valley	16.00 to 16.50
Gray forge, Pittsburgh	16.90 to 17.40

Ferro-Alloys.—The heaviest consumer in this district several days ago closed negotiations for between 6,000 and 8,000 tons of 50 per cent ferro-silicon, about 1,200 tons of ferro-chromium and about 1,000 to 1,200 tons of aluminum, for shipment next year to plants in this vicinity. The transaction was quietly consummated and no advice relative to prices is given. Because of the tonnage involved, it is probable that the consumer was able to shade prevailing quotations, considerably. Although some interests have not yet advanced quotations on lower grades of ferro-silicon, it is not believed that maximum prices could be shaded. Ferro-manganese is selling at $75, seaboard, for prompt delivery.

We quote 80 per cent ferro-manganese at $70 to $75, Baltimore, for prompt delivery and $61 for forward shipment. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted at $75, Pittsburgh, for prompt and forward delivery; 12 to 13 per cent, $25 to $26, 11 to 12 per cent, $24 to $25; 10 to 11 per cent, $23 to $24; 9 to 10 per cent, $22 to $23, f. o. b. Globe, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

On ferro-titanium we quote 8 cents per pound for carload lots; 10 cents per pound for 2,000 pound lots and over, and 12½ cents per pound in lots up to 2,000 pounds.

Plates.—Demand for steel plates continues heavy and sales are being made at a range from 1.45c to 1.60c for forward shipment. Unusually heavy tonnages are involved in pending inquiries for cars. The Chicago, St. Paul, Minneapolis & Omaha railroad has ordered 500 gondolas and 500 40-foot steel underframe box cars from the American Car & Foundry Co. The Missouri Pacific is in the market for 4,000 box cars and the Illinois Central is negotiating for 3,000 gondolas, 1,000 box cars and 500 stock cars.

The Riter-Conley Mfg. Co. has taken an order for 1,200 tons of riveted steel pipe for a pipe line project along the Salmon river in Franklin county, N. Y. This project involves about 1,200 feet of 11-foot 6-inch pipe, 360 feet of 8-foot pipe, and 260 feet of 12-foot pipe, to be built for the Erie Construction Co.

Some of the independent mills are having no trouble in selling plates at 1.90c for prompt shipment. Quotations for both prompt and forward delivery follow:

Standard steel plates ¼ inch thick. 6¼ to 100 inches, 1.45c to 1.60c for shipment after Jan. 1 and 1.65c to 1.90c for prompt shipment. For extras, see card of Sept. 1, 1909.

Sheets.—Sheet mills in all parts of the country are affected by the scarcity of raw material and it has been

almost impossible for many plants to operate at maximum capacity. All of the mills have heavy tonnages on their books for next year's shipments and unless the situation is relieved deliveries during the first half may be more deferred than during the last half of this year. Early this year prevailing quotations were shaded by some of the independent mills. Such is not the case at the present time; makers seem inclined to quote above rather than below the market price of today. Quotations for forward delivery are as follows:

Flat Sheets.

Black Sheets.—Nos. 10-12 gage, $1.90 per 100 pounds; Nos. 13-14 gage, $1.95; Nos. 15-16 gage, $2.00; Nos. 17-21 gage, $2.05; Nos. 22-24 gage, $2.10; Nos. 25-26 gage, $2.15; No. 27 gage, $2.20; No. 28 gage, $2.25; No. 29 gage, $2.30; No. 30 gage, $2.40.

Tin mill sizes. Nos. 15-16 gage, $2.00 per 100 pounds; Nos. 17-21 gage, $2.05; Nos. 22-24 gage, $2.10; Nos. 25-27 gage, $2.15; No. 28 gage, $2.20; Nos. 29-30 gage, $2.25; Nos. 30½-31 gage, $2.30; No. 32 gage, $2.35.

Blue Annealed.—Nos. 3-8, $1.60 per 100 pounds; Nos. 9-10, $1.65; Nos. 11-12, $1.70; Nos. 13-14, $1.75; Nos. 15-16, $1.85.

Galvanized.

Nos. 10-11 gage, $2.40 per 100 pounds; Nos. 12-14 gage, $2.50; Nos. 15-16 gage, $2.65; Nos. 17-21 gage, $2.80; Nos. 22-24 gage, $2.95; Nos. 25-26 gage, $3.10; No. 27 gage, $3.25; No. 28 gage, $3.40; No. 29 gage, $3.55; No. 30 gage, $3.70.

Roofing Sheets

Net extras on all gages per 100 pounds. Corrugated 2-inch, 2½-inch, 3-inch and 5-inch corrugation, 5c; 2 V crimped without sticks, 5c; corrugated 1¼-inch corrugation, 10c; 3 V crimped without sticks, 10c; pressed standing seam with cleats, 15c; plain roll roofing with or without cleats, 15c.

Painted Roofing.

12 to 18 gage, inc., 5c; 19 to 24 gage, inc., 10c; 25 to 28 gage inc., 15c.

Tin Plate.—Heaviest consumers of tin plate have covered requirements for next year, although there are a number of condensed milk can interests that have not yet closed negotiations for next year's needs. Many of these interests last year over-estimated requirements and will have considerable stock on hand Jan. 1. The $3.60 base price continues to prevail and probably will not be withdrawn this year. Quotations follow:

Coke tin plate, 100-pound basis, 14 x 20, $3.60, f. o. b. mill, Pittsburgh district.

Rails.—No large orders for steel rails have been taken in this district. Plants already have sufficient tonnage on their books to necessitate maximum operation through the first six months of the year. Some of the railroads that placed orders several weeks ago have supplemented tonnages recently. Nearly all of the 1913 contracts have been specified against, and officials are now busily engaged working out specifications.

Demand for spikes continues heavy and shipments are more and more deferred each week. Railroads have been satisfied with stock of inferior quality when in urgent need of material. Rails are quoted as follows with a base price on open-hearth standard sections at 1.35c per pound at the mill:

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.25c, the schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c, Pittsburgh; track bolts, 2.40c to 2.50c, base, Pittsburgh.

Railroad Spikes.

4½, 5 and 5½ and 9-16	$1.90
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x 7-16	.20
3, 3½, 4 and 4½ x ⅜	.30
2½ x ⅜	.40
2½, 3 and 3½ x 5-16	.60
2 x 5-16	.80

Billets and Sheet Bars.—The market for semi-finished steel products continues rather inactive notwithstanding the fact that fairly heavy tonnages are involved in pending inquiries. A consumer who attempted to buy Bessemer and open-hearth sheet bars a few days ago advises that it is impossible to shade the prevailing maximum quotation, and we quote the former at $28 and the latter at $28.50, f. o. b. Pittsburgh and Youngstown mill. In fact, it is doubted whether material could be obtained at prevailing maximum quotations. Sheet and tin mills have been affected by the scarcity of raw material and prospects for the future are no brighter than those of the present. Revised quotations follow:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $27.00, with the usual extra for size and analysis, and open-hearth rolling billets, $27.50. Bessemer sheet and tin bars are quoted at $28.00 and open-hearth sheet bars are quoted $28.50, f. o. b. Pittsburgh and Youngstown, with full freight to destination added. Forging billets are quoted at $34.00, Pittsburgh.

Hoops and Bands.—Although hoops are quoted at a range from 1.50c to 1.60c for forward delivery, it is understood that some independent makers are obtaining premiums whenever possible to assure rather prompt shipment. This also holds true regarding steel bands. Specifications continue heavy and there has been some new demand. Quotations follow:

Hoops in carload lots, 1.50c to 1.60c, Pittsburgh, in less than carload lots, 1.55c to 1.60c; bands, 1.40c to 1.45c, base, with net extras, as per standard steel.

Merchant Bars.—Steel bars continue to be quoted at 1.40c to 1.45c for forward delivery and it is practically impossible to obtain tonnage for shipment this year. Anxious consumers have scoured the market in vain when in need of prompt material. Mills continue to scrutinize contracts and reductions of tonnages are made in almost every instance.

Common iron bars are quoted at a range from 1.70c to 1.80c for forward delivery and the maximum quotation characterizes what little tonnage is being sold for prompt shipment. Cold rolled shafting continues to be quoted on a basis of 60 per cent off for carload lots and 55 per cent off for less than carload lots. Quotations continue as follows:

Common iron bars, 1.70c to 1.80c, Pittsburgh; Bessemer and open-hearth steel bars, 1.40c to 1.45c; plow and cultivator, 1.45c to 1.45c; channels, angles, zees, tees, under 3 inch, 1.50c to 1.55c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds and not less than 1,000 pounds of a size, 0.15 advance, less than 1,000 pounds of a size, 0.35. Cold rolled and ground shafting, 60 per cent off in carloads and 55 per cent in less than carloads delivered in base territory.

Muck Bar.—About 1,000 tons of muck bar were obtained by a consumer in this district a few days ago at $32, Pittsburgh. This is the first sale noted for some time. Eastern sales have offered muck bar at $2 a ton above this figure, but such offers have been declined by consumers here. We quote muck bar at $32, Pittsburgh.

Bolts, Nuts and Rivets.—Makers continue to book rather heavy tonnages and prevailing quotations are not being shaded in any instance. In fact, some makers are inclined to quote above the official discounts. That advances will be made before the end of the year is the general belief held by the trade. Prices of bolt and nut discounts follow:

Rivets

Button head structural rivets, 2.10c; cone head boiler rivets, 2.20c.

Bolt and Nut Discounts

Carriage bolts, ⅜ x 6 inches, smaller and shorter, rolled threads, 75, 10 and 2½; cut threads, 75 and 7½; larger and longer, 70 and 5.

Machine bolts with hot pressed nuts, ⅜ x 4 inches, smaller and shorter, rolled, 75, 10, 10 and 2½; cut, 75, 10 and 7½; larger and longer, 70, 10.

Gimlet and cone point lag or coach screws, 80 and 10.

Hot pressed square, blank or tapped nuts, $5.80 off list; hot pressed hexagon blank or tapped, $6.40.

Cold pressed C. & T. square, blank or tapped, $5.80 off; hexagon, blank or tapped, ⅜-inch and larger, $6.70 off; smaller than ⅜-inch, $7.30 off.

Structural Shapes.—It is just about impossible to obtain structural shapes for anything like prompt delivery. On forward shipment, shapes are quoted at a range from 1.45c to 1.60c. Fabricators are in a better position to make delivery than was the case a month or so ago.

The Riter-Conley Mfg. Co. has taken a contract for a viaduct to be built

at West Jefferson, O., by the Pennsylvania railroad. This contract involves about 800 tons of structural steel. The Davies-Bach Mfg. Co., Alliance, O., will build a 70 x 200-foot plant and has awarded the contract for steel to the McClintic-Marshall Construction Co. About 55 tons are involved. The West Maryland railroad has placed contracts for steel with the McClintic-Marshall company for bridges at Henry and Chaffee, W. Va. Prices follow:

Standard structural shapes, 1.45c to 1.60c, for shipment after Jan. 1 and 1.60c for prompt shipment. For extras see card of Sept. 1, 1909.

Merchant Pipe.—As the year draws to a close, the pipe market becomes quieter. There has been some demand for shipment to the west, southwest and the south and a large number of consumers have supplemented purchases made earlier in the quarter. Mills are being urged for shipment, although it will be impossible for many of them to fill orders now on the books until after Jan. 1. Prevailing discounts of jobbers, subject to the preferential discount of the large buyer, are as follows:

Iron and Steel Pipe Basing Prices.

STEEL.

	Butt.		Lap.	
	Black.	Galv.	Black.	Galv.
⅛, ¼ and ⅜ inch.	72	52	..	..
½ inch	76	66	..	..
¾ to 3 inch	79	71	..	..
2 inch	..	..	76	68
2½ to 6 inch	..	..	78	70
7 inch to 12 inch	..	..	76	66
13 to 15 inch	..	..	53	..
Extra Strong, Plain Ends.				
⅛, ¼ and ⅜ inch.	68	58	..	..
½ inch	73	67	..	..
¾ to 1½ inch	77	71	..	..
2 to 3 inch	78	72	..	..
2 inch	..	..	74	66
2½ to 4 inch	..	..	76	68
4½ to 6 inch	..	..	75	67
7 to 8 inch	..	..	68	58
9 to 12 inch	..	..	63	53
Double Extra Strong Plain Ends.				
½ inch	63	57	..	..
¾ to 1½ inch	66	60	..	..
2 to 2½ inch	68	62	..	..
2 inch	..	..	64	58
2½ to 4 inch	..	..	66	60
4½ to 6 inch	..	..	65	59
7 to 8 inch	..	..	58	48

IRON.

⅜ inch	66	47	..	..
½ inch	70	57	..	..
¾ to 2½ inch	73	62	..	..
2 inch	..	..	69	59
2½ to 6 inch	..	..	71	62
7 to 12 inch	..	..	69	56
Extra Strong Plain Ends, Card Weight.				
⅜ inch	64	53	..	..
½ inch	68	61	..	..
¾ to 1½ inch	72	63	..	..
2 and 2½ inch	73	64	..	..
2 inch	..	..	67	59
2½ to 4 inch	..	..	71	62
4½ to 6 inch	..	..	70	61
7 to 8 inch	..	..	64	54
9 to 12 inch	..	..	59	48
Double Extra Strong Plain Ends, Card Weight.				
½ inch	58	50	..	..
¾ to 1½ inch	61	53	..	..
2 and 2½ inch	63	55	..	..
2 inch	..	..	56	50
2½ to 4 inch	..	..	61	55
4½ to 6 inch	..	..	60	54
7 and 8 inch	..	..	53	43

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

The above discounts are for full weight pipe, subject to a variation of 5 per cent, merchant pipe, when specified, being furnished up to 6 inches at one point higher discount (lower price).

Boiler Tubes.—No change is noted in the market for boiler tubes. Specifying continues liberal and there has been some new demand for both iron and steel products. Discounts follow:

	Steel.	Iron.
1½ inch	..	..
1¾ to 2¼ inch	62	47
2½ inch	64½	52
2¾ to 3¼ inch	69½	54½
3½ to 4½ inch	72	57
5 and 6 inch	64½	..
7 to 13 inch	62	..

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire.—There is no change in the market for wire products. The leading interest continues to quote nails at $1.70 and wire at $1.50, and these prices are offered by a few of the independent makers. Other independent mills are quoting products $1 a ton above these figures. It is generally believed that prices will be on a uniform basis before the end of the year. Cut nails, western makers, are quoted at $1.70. Prices follow:

Wire nails, jobbers' carload lots, $1.70 to $1.75, retailers' carload lots, $1.75 to $1.80; cut nails (western makers), jobbers' lots, $1.70; painted barb wire, jobbers' carload lots, $1.70 to $1.75; retailers' carload lots, $1.75 to $1.80, with 40c for galvanizing; plain wire to jobbers in carloads, $1.50 to $1.55; and to dealers, in carloads, $1.55 to $1.60; polished staples, $1.70 to $1.75; galvanized staples, $2.10.

Wire Rods.—Some of the leading makers have temporarily withdrawn from the market and are offering only in specified tonnage. The last sale of rods made in this district was at $30, Pittsburgh, and we quote both Bessemer and open-hearth iron rods at that figure.

Coke.—The coke market remains unchanged, although many in the trade believe that no more contract furnace coke can be obtained at $3, ovens. Several sales at $3.50, ovens, have been noted, but the general market has not yet gone above $3.25, ovens. A Canadian interest this week closed for about 12,000 tons for 1913 shipment at between $3 and $3.25, ovens. The Wheeling Steel & Iron Co., Wheeling, W. Va., is negotiating for 30,000 tons a month to be shipped next year. Considerable foundry coke has sold at $4.75, ovens, for prompt shipment and it is not believed possible to shade $4 for contract 72-hour fuel.

One furnace in the valley district has blown out and another in this vicinity is expected to go out shortly, which will release considerable coke now under contract. With the approach of winter, it is believed that prices will advance considerably. The Connellsville *Courier* for the week ending Nov. 16, says production made a gain of 1,476 tons over the week before, the increase being about equally divided between merchant and furnace ovens. Shipments made a net increase of 34 cars. We quote as follows:

Connellsville furnace	$3.80 to 4.00
Connellsville furnace contract	3.00 to 3.25
Connellsville foundry	4.50 to 4.75
Connellsville foundry contract	4.00 to 4.25

Old Material.—Heavy melting steel continues to hover around the $15 mark and there are some indications that the market will become weaker in the near future. Dealers in outlying towns who have been holding stock for a long time are beginning to sell to the large city dealers and considerable stock is being moved.

A couple of yards owned by local middlemen have been embargoed by the railroads and there is an embargo against the Pittsburgh Steel Co. The one against the Carbon Steel Co. was lifted several days ago.

Low phosphorus continues to sell in the neighborhood of $18 and other grades remain about the same. While dealers are selling heavy melting scrap at $15, most of them are shipping material sold several weeks ago at $16 and $16.50. The following prices prevail:

Heavy melting scrap	$15.00
Rerolling rails	16.50 to 17.00
Malleable	14.50 to 15.00
Agricultural malleable	13.25 to 13.75
Bundled sheet scrap	13.00 to 13.50
Iron axles	25.00 to 26.00
Old iron rails	16.75 to 17.25
Stove plate	11.00 to 11.50
No. 1 wrought scrap	15.50 to 16.00
Old car wheels	15.75 to 16.25
Low phosphorus	18.00 to 18.50
Machine shop turnings	11.00 to 11.50
No. 1 busheling	14.25 to 14.75
Country mixed	11.00 to 11.25
Cast borings	10.25 to 10.50
No. 1 cast scrap	14.50 to 15.00

Starts Work on Mill.—The new mill of the Republic Iron & Steel Co., Youngstown, O., at the Brown-Bonnell works, probably will be completed within two months. The McClintic - Marshall Construction Co., Pittsburgh, has started work on the building, which will be 145 x 815 feet and calls for 1,400 tons of structural steel. Three trains of modern mills will be contained. Two large traveling cranes will handle the product.

Charles M. Schwab, president of the Bethlehem Steel Co., is building a $20,000 office and laboratory in order that the officials of the army and navy who do business with the company may have proper accommodations.

CHICAGO

Railroad Buying Most Prominent Feature

Office of THE IRON TRADE REVIEW,
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Specifications for the month of November are increasing at a rate that may establish a new record. The total already on the books of some producers in this territory is in excess of that received during any month of the year with the exception of October. Deliveries on specifications in finished lines are months behind, and in some instances cannot be made before next July. Railroad buying is the most prominent factor in this market and orders for almost 30,000 cars have either been closed during the week or will be in the next few days. Quotations on hard steel bars and structural rivets have stiffened considerably and finished lines on the whole show a marked upward tendency. There can be no doubt of prosperity during the coming year as the steel necessitated by railroad purchases leaves a comparatively small amount of the year's capacity to be consumed in other quarters.

Pig Iron. — Notwithstanding some evidence of price shading on low grade iron for prompt shipment by Birmingham producers the market for forward delivery is stronger and the minimum quotation of $14 for first quarter delivery has disappeared. Southern producers are now firm on a basis of $14.50 for first quarter and with few exceptions $15 is the best price that can be obtained for second quarter shipment. It is understood that the Warner furnaces have placed 5,000 tons at that price during the week. The Kalamazoo Stove Co. has taken 1,000 tons of off iron for prompt shipment at a price understood to be on a basis of $14, Birmingham, and a Milwaukee melter has taken 1,000 tons of southern iron for the same delivery at a price slightly under $14, Birmingham. A leading southern producer has sold 5,000 tons of No. 2 iron for export during the second quarter at $14.75. Northern iron remains firm on a basis of $18, local furnaces, and although a quiet market is reported from some sections, sales continue at a fair rate and inquiries for small tonnages are appearing in good numbers. There is a brisk inquiry for Jackson county 8 per cent silicon, which sellers are having difficulty in satisfying. This includes lots of 300 and 200 tons and one for an indefinite tonnage. A Chicago consumer has been inquiring for a lot of from 1,000 to 2,000 tons of 8 per cent silveries, but is understood to have withdrawn from the market, owing to the fact that no quotation below $19, furnaces, can be obtained.

The following prices represent the market for Chicago delivery, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnaces:

	Prompt shipment.	First quarter.
Lake Superior charcoal	$18.75	$18.75
Northern foundry No. 2	18.00	18.00
Southern foundry No. 2	18.35	18.85
South'n Silveries, 5 per cent sil.	.....	19.85
Jackson co. silv'r's 8 per cent.	21.40	21.90
Malleable Bessemer	18.00	18.00
Alabama basic	.....	18.85

Merchant Bars.—The minimum quotation for bar iron is disappearing rapidly and the market is firmer up to a basis of 1.60c. The difficulty in placing business in hard steel bars is more pronounced and the lowest quotation in this market is now 1.65c. Producers in this territory are refusing to quote on soft steel bars and a number of representatives of eastern makers are maintaining the same attitude. The period for delivery on bar iron remains about six weeks, although delivery from 8-inch mills can be had in 10 days in some cases, owing to the widespread substitution of wire products for that size.

We quote, f. o. b. Chicago, as follows:

Bar iron, 1.55c to 1.60c, hard steel bars, rerolled, 1.65c to 1.75c, soft steel bars, bands and small shapes, 1.63c; hoops, 1.63c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting 60 per cent off list for carload lots, 55 per cent off for less than carloads.

On iron and steel from local stock, we quote as follows:

Bar iron, 1.95c per pound base; soft steel bars, 1.95c per pound base; soft steel hoops, 2.20c, full extras.

Structural Material.—Heavy specifications for this material are increasing mill difficulties and it is now practically impossible to place new business for any delivery during next year. Deliveries on specifications are in the majority of cases delayed six months, and it is probable that the first of July will witness an unfilled tonnage as large if not larger than that which will be carried over Jan. 1. Sellers in this territory, including eastern mills, are fighting off second half business on this account. With but few exceptions, which are due to openings in rolling schedules, it is impossible to obtain early mill delivery and such business must be placed with jobbers. Structural contracts placed during the week show considerable improvement in tonnage if not numbers, due to two orders taken by the leading interest. These consist of 8,500 tons taken from the Inspiration Copper Co. for smelter buildings at Miami, Ariz., and 4,000 tons taken from the Interstate Transfer Railway Co., for viaducts. The same maker has also taken 113 tons from the National Guard of California for an armory and state arsenal at Sacramento. A. Bolter's Sons have taken 611 tons from the city of Chicago for a foundry building at 2324 South Ashland avenue. Prices follow:

Beams and channels, 15 inch and under, 1.68c. For extras, see Pittsburgh report.

Store prices are as follows:

All angles, 3 inches and larger, including 6 inches, $2.05 per 100 pounds; angles over 6 inches, $2.15 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $2.05 per 100 pounds, base; channels, 3 inches and larger, $2.05 per 100 pounds, base.

Rails and Track Fastenings.—The week has been marked by another run of exceptionally heavy specifications for track fastenings and a marked upward tendency is evident in the market for both spikes and track bolts. Notwithstanding the fact that very heavy rail orders have been placed during the past few weeks, additional tonnages are pending which will go far toward taxing the capacity of this district for the coming year. The business placed in this territory continues to be divided between the leading interest and eastern independents, the former obtaining by far the larger part.

We quote, light rails, f. o. b. Chicago, and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 25 to 45-pound, 1.30c; 16 to 20-pound, 1.35c; 12-pound, 1.40c; 8-pound, 1.50c.

Light section relayers, 45 pounds and under, subject to inspection, $22 to $24; stand-

ard section relaying rails, subject to inspec-

Track fastenings f. o. b. Joliet are as follows:

Track fastenings, f. o. b. Joliet, angle bars 1.50c; railroad spikes, 1.95c; smaller size spikes, 1.75c base; track bolts with square nuts, 2.30c to 2.40c.

Plates.—Exceptionally heavy car orders are further increasing the difficulty of the mills in this territory. The Missouri Pacific is negotiating for 4,000 box cars, the Coal & Coke for 500 coal cars and the International & Great Northern is in the market for 1,000 box cars. The Minneapolis, St. Paul & Sault Ste. Marie is inquiring for 20 caboose cars and the Illinois Central is asking bids on 3,000 gondolas, 1,000 box cars, 500 stock cars. The Duluth & Iron Range and the Duluth, Missabe & Northern are in the market jointly for 1,000 ore cars. The Harriman lines are said to have ordered 2,000 gondola cars from the Bettendorf Axle Co. This item, however, has not been confirmed. The same buyers are negotiating for over 8,000 cars in addition to the gondolas. The Chicago, St. Paul, Minneapolis & Omaha has ordered 500 steel gondola cars and 500 40-foot steel underframe box cars from the American Car & Foundry Co., and two steel baggage cars, one steel dining car and two 2-compartment cars from the Pullman Co. The Chicago & Northwestern, previously mentioned as having closed contracts for cars, has ordered 1,000 box cars, 500 flat cars and 1,000 steel ore cars from the Pullman Co., 1,500 steel underframe box cars and 2,000 steel gondolas from the American Car & Foundry Co., 10 steel passenger cars, 23 baggage cars, three steel dining cars, four steel parlor cars and two buffet cars from the Pullman Co. The same buyer has also taken 10 steel smoking cars from the American Car & Foundry Co.

We quote, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6⅝ to 100 inches wide, 1.68c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, $2.05.

Bolts, Nuts and Rivets.—Rivets have been advanced to 2.28c in this territory and one of the largest independent producers is out of the market for first half delivery and refuses to quote second half. The market for bolts and nuts is very firm and advances are expected at an early date.

We quote prices on bolts, nuts and rivets as follows:

Rivets

Structural rivets, ½ to 1¼ inches, 2.28c, base, Chicago, in carload lots; boiler rivets, 0.10c additional.

Bolt and Nut Discounts

Carriage bolts up to ⅝ x 6 inches, rolled thread, 75-10-2½; larger sizes, 70-5.

Machine bolts, up to ⅝ x 4 inches, rolled thread, 75-10-7½; cut thread 75-10-2½; larger sizes, 70-10.

Hot pressed nuts, square head, $5.80 off per cwt.; hexagon, $6.40 off per cwt.

Sheets.—Sheet makers in this territory are practically out of the market, as their capacities for first half are exhausted and second half business is undesirable. Prices follow:

Blue annealed, No. 10, 2.15c; No. 12, 2.20c. Box annealed, No. 28, 2.70c. Galvanized No. 28, 3.95c.

For mill prices, see Pittsburgh report. Freight to Chicago, 18 cents.

Wire Products.—Quotations on wire products remain on the same basis and there is no evidence of a slackening in demand. Independent producers are reported as adhering firmly to the advanced quotations previously announced.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.88; retailers' carload lots, $1.93, retailers' less than carload lots, $1.98; painted barb wire, jobbers' carload lots, $1.88; retailers' carload lots, $1.93; retailers' less than carload lots, $1.98, with 40c for galvanizing; plain wire, jobbers' carload lots, $1.68; retailers' carload lots, $1.73.

Merchant Pipe and Tubes.—Makers in this territory report a little less activity in the market, which is welcomed on account of the delivery situation. Store prices follow:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
Butt.				
⅛ inch and ¼ inch.	69.2	48.2	62.2	41.2
⅜ inch	73.2	62.2	67.2	51.2
½ inch to 1½ inch.	76.2	67.2	70.2	58.2
Lap.				
2 inch	73.2	64.2	67.2	57.2
4½ inch to 6 inch.	75.2	66.2	68.2	59.2
Card Weight.				
7 inch to 12 inch...	72.2	61.2	66.2	55.2
Extra Strong Plain Ends.				
Butt.				
⅛, ¼, ⅜ inch.....	64.2	52.2	59.2	47.2
½ inch	69.2	57.2	64.2	52.2
2 inch to 3 inch....	74.2	62.2	....	....
Lap.				
2 inch	70.2	58.2	65.2	53.2
7 inch to 8 inch....	64.2	52.2	59.2	47.2
Double Extra Strong.				
Butt.				
½ inch	57.2	45.2	....	....
¾ inch to 1½ inch	60.2	48.2	....	....
Lap.				
2 inch	58.2	46.2	....	....
4½ inch to 6 inch..	59.2	47.2	....	....
7 inch to 8 inch....	52.2	40.2	....	....

Tubes.

	Lap weld steel.	Charcoal iron.	Shelby seamless.
	Per cent.	Per cent.	Per cent.
1 inch	37	..	55½
1¼ to 2¼ inch.....	53	38	34
2¾ to 3¼ inch.....	63	48	44
3½ to 4½ inch.....	65½	48	44
5 to 6 inch.....	53	..	..

Cast Iron Pipe.—The market for this material is practically unchanged from the previous week and specifications for small tonnages continue to rule. The larger buyers are continuing to delay their purchases in the hope that more advantageous quotations will appear after the first of the year. We quote f. o. b. Chicago, as follows:

Four-inch water pipe, $31, 6 to 12 inches, $29, larger sizes, $28, gas pipe, $1 a ton higher.

Old Material.—Although quotations remain unchanged with very few exceptions, the scrap market is still weak and dealers are still unable to unload their stocks to advantage. The present condition of the market may be ascribed in part to an increased production of scrap by users of finished lines. This coupled with the fact that the consumption of rolling mill grades is comparatively little in excess of last year, tends to keep the market at lower levels. Consumers in this territory still have sufficient stocks on hand to run from 60 to 120 days and consequently are not prepared to buy except at bargain prices. There has been a slight increase in railroad offerings during the week which is augmented by increased offerings from scrap producers throughout the territory. The C., B. & Q. has invited bids on a small list and the Chicago, Milwaukee & St. Paul has sent out 3,825 tons, of which the principal item is 500 tons of steel rails. The Rock Island has also invited bids on about 3,000 tons of mixed scrap, of which the principal item is 800 tons of No. 1 steel rails. A small list has been issued by the Grand Trunk.

We quote for delivery in consumers' yards, Chicago, as follows:

Gross Tons

Old car wheels	$14.75 to 15.25
Old iron rails	17.00 to 17.50
Rerolling rails (5 ft. and over)	16.25 to 16.75
Old steel rails (3 ft. and und.)	14.50 to 15.00
Frogs, switches and guards	13.75 to 14.25
Heavy melting steel	13.50 to 14.00
Shoveling steel	13.50 to 14.00

Net Tons

No. 1 R. R. wrought	$12.75 to 13.25
No. 2 R. R. wrought	11.75 to 12.25
Arch bars and transoms	17.00 to 17.50
Knuckles, couplers and springs	12.75 to 13.25
Shafting	16.50 to 17.00
Iron car axles	21.50 to 22.00
Steel car axles	17.75 to 18.25
Locomotive tires	13.50 to 14.40
Dealers forge	10.75 to 11.25
Pipe and flues	10.00 to 10.50
No. 1 cast	13.50 to 14.00
No. 1 busheling	11.25 to 11.75
No. 2 busheling	8.50 to 9.00
No. 1 boiler cut	10.00 to 10.50
Boiler punchings	13.00 to 13.50
Cast and mixed boring	7.25 to 7.75
Machine shop turnings	8.25 to 8.75
Railroad malleable	13.50 to 14.00
Agricultural malleable	12.25 to 12.75
Angle bars, splices, etc., iron	16.50 to 17.00
Angle bars steel	12.50 to 13.00
Stove plate and light cast scrap	11.00 to 11.50

CLEVELAND

Premiums on High Grade Ores Dropped

Office of THE IRON TRADE REVIEW,
Penton Bldg., Nov. 26.

Iron Ore.—Very heavy reservations made by steel companies have been converted into contracts during the past few days and some steel companies are buying additional tonnages which are not provided for by reservations. One large independent steel company manifested a disposition to delay buying, but came into the market Tuesday. Buying of non-Bessemer ores has not proceeded with anything like the rapidity of Bessemer ores, as the merchant furnaces are showing an inclination to await developments. An important concession has been made to consumers of non-Bessemer ores by the decision of two ore sellers, concurred in by all the other mining companies, to eliminate the premiums on high grade ores. Several years ago, in response to sentiment among furnace men that prices of low grade ore were relatively too high, a schedule of penalties to be assessed against ore sellers was agreed upon for low grade ores, and at the same time, premiums on high grade ores were provided. On non-Bessemer ores running over 53 per cent iron natural, there was added to the base unit the following:

For an ore 53 to 54 per cent, base unit value plus 1c.
For an ore 54 to 55 per cent, base unit value plus 2c.
For an ore 55 to 56 per cent, base unit value plus 3c.
For an ore 56 to 57 per cent. base unit value plus 4c.
For an ore 57 to 58 per cent, base unit value plus 5c.

This made a premium of 15 cents per ton for all ores running 58 per cent natural or above. Some sellers last year found difficulty in disposing of their ores with these premiums attached. Hence the decision to eliminate the premiums. Another change of considerable importance has been made in the form of contract. Owing to the controversy which has arisen in regard to the taxing of ore on dock, each contract will provide hereafter that the buyer of the ore agrees to pay the taxes. Hence, if a furnace has any ore on dock at the time of taxation in April, it will be compelled to pay the treasurer of the county where the ore is stored.

The lake season is rapidly nearing its end. The season closes officially at midnight next Saturday, and very little ore will be moved after that time. All of the vessels of the Pittsburgh Steamship Co. are now in port.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.40; Mesabi Bessemer, $4.15; old range non-Bessemer, $3.60; Mesabi non-Bessemer, $3.40.

Pig Iron.—Cleveland furnaces have advanced their minimum quotation to $17.75, delivered in the city. Experience in competitive business indicates that valley producers are not selling at less than $17.50, valley. The market in this immediate district is quiet but very strong. For delivery this year and the first half of next year, we quote as follows, delivered Cleveland, the higher quotations being for prompt delivery:

No. 1 foundry	$18.25 to 18.75
No. 2 foundry	17.75 to 18.00
No. 2 southern	18.35 to 18.85
Bessemer	18.15 to 18.40
Lake Superior charcoal	19.10 to 19.75
Silveries, 8 per cent silicon	20.55 to 21.55
Bessemer ferro, 11 per cent	26.55

Coke.—The stack of the Struthers Furnace Co., Struthers, O., has been blown out for relining and 15,000 tons of spot coke have been thrown on the market. This coke will eagerly be absorbed. The demand is very active with strong quotations.

Connellsville furnace coke, $3.75 to $4.00 for prompt delivery, and $3 to $3.25 on contract; Connellsville foundry coke, $4.50 for prompt, and $4.00 to $4.25 on contract.

Finished Material.—The contract for the Cleveland Electric Illuminating building on the Public Square, 1,500 tons, has been awarded to T. H. Brooks & Co. It is understood that several Cleveland concerns will figure on two revolving pontoon cranes for the Panama canal, involving 1,500 tons of structural material each. The Lake Shore railroad will soon be in the market for a round tonnage for a bridge and some other railroad business involving a fair tonnage is expected to develop at a not far distant date. The receiver of the Wheeling & Lake Erie railroad has asked permission of the court to purchase 3,000 cars and 20 locomotives. Other contracts pending are the State Normal College, at Bowling Green, high school at Bowling Green, post office at Wooster and Huron county court house. A forging company in the Buffalo district which has purchased several thousand tons more of forging billets than is needed for its own requirements has been selling the billets at $35, Buffalo. An unusual example of expedients resorted to in order to obtain material promptly is the use of skelp for car roofing. Delivery can be obtained in about three weeks on skelp. Sheet steel piling is selling in small lots at 1.60c, Pittsburgh, and there is active inquiry.

Old Material.—An improved tone rules the market. Three plants consuming heavy melting steel, including one of the largest independent mills of Pittsburgh and valley consumers, have put out inquiries in the local market for that grade. Indications point to an advance in prices. Good demand exists for No. 1 machine cast, and rolling mills are buying liberally of No. 1 busheling. The market in general shows a more hopeful aspect, but prices are unchanged from last week. We quote, f. o. b. Cleveland, as follows:

Gross Tons.

Old iron rails	$17.75 to 18.50
Old steel rails (under 6 ft.)	15.00 to 15.50
Old steel rails (over 6 ft.)	16.25 to 16.75
Relaying rails	25.00 to 26.00
Old steel boiler plate	11.50 to 12.00
Malleable iron (railroad)	14.50 to 15.00
Steel axles	19.50 to 20.00
Axle turnings	12.50 to 13.00
Malleable iron (agricultural)	13.00 to 13.50
Heavy steel	13.50 to 14.00
Country mixed steel	11.00 to 11.50
Bundled sheet scrap	11.50 to 12.00

Net Tons.

No. 1 R. R. wrought	$14.50 to 15.00
No. 1 busheling	12.50 to 13.00
No. 1 machine cast	13.50 to 14.00
No. 1 dealers' wrought	11.50 to 12.00
Machine shop turnings	8.25 to 8.50
Pipes and flues	10.00 to 10.50
Wrought drillings	8.50 to 8.75
Cast borings	8.00 to 8.50
Stove plate	10.50 to 11.00
Wrought iron piling plate	16.00 to 16.50
Wrought iron arch bars	17.00 to 17.50

The Davies-Bach Mfg. Co., Alliance, O., will build a new steel and brick building 70 x 200 feet in that city. The company recently completed its initial building, 60 x 200 feet. Contracts for both structures were awarded the McClintic-Marshall Construction Co., Pittsburgh. About 55 tons of steel will go into the new building. The Davies-Bach company manufactures airless tires.

CINCINNATI

Resale Iron Has Some Influence

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg., Nov. 26.

Pig Iron.—The market is stationary, with very little buying and selling in evidence. General inquiries are few and light, but the strength that has characterized the situation for some time still prevails. There is an almost general feeling that the present prices will hold throughout the first half of next year without any advances of importance, as most of the producers are in favor of a conservative system, and believe that the forcing of higher figures might be unwise. There is no belief, however, that quotations will be lowered, as the high coke and ore prices, and the fact that stocks are constantly being reduced, would make conditions stronger.

Southern iron is quoted at from $14 to $15 for the first half, Birmingham basis. In Tennessee, the maximum price is $14.50, and in Alabama it is also the highest asked by most of the furnaces. A few are holding for $15 for the second quarter, but very little iron, if any, has been sold in this territory at this figure. The general quotation for the first quarter in both states is $14 to $14.50, Birmingham, with the lower price prevailing. There is a little furnace iron to be had in Tennessee for December delivery for $13.50, Birmingham, and there is some resale iron of both Tennessee and Alabama makes for the same figure for the first quarter, but its effect is not felt, especially that of furnace iron, as most of the sales being made at present extend into the first quarter or half.

The situation in southern Ohio is inactive but strong. Furnace iron is holding fairly well at $17, Ironton, for any delivery through the first half, but it has developed recently that there is a quantity of resale iron being offered at $16.50 and $16.75, Ironton. Sales in this territory have been light recently, and the market has, therefore, not been tested to any extent.

There are inquiries in the market as follows: Five hundred to 1,000 tons of southern No. 2 iron for first half shipment to central Ohio; 3,000 tons of forge and No. 3 foundry iron for January and February shipment to an eastern pipe company; 1,000 tons of southern No. 2 and 1,500 tons of northern from southeastern Wisconsin; 500 tons of charcoal iron for the first half, from Pittsburgh, and 200 to 300 tons of silvery iron from southern Michigan for the first half. With freight rates $3.25 from Birmingham, and $1.20 from Ironton, we quote Cincinnati prices as follows:

Southern foundry No. 1	$17.75 to 18.25
Southern foundry No. 2	17.25 to 17.75
Southern foundry No. 3	16.75 to 17.25
Southern foundry No. 4	16.50 to 17.00
Southern gray forge	16.50 to 16.75
Mottled	16.25 to 16.75
Southern No. 1 soft	17.75 to 18.25
Southern No. 2 soft	17.25 to 17.75
Standard southern car wheel	31.00 to 31.50
Northern No. 2	17.95 to 18.20
Northern No. 3	17.45 to 17.95
Northern No. 4	17.20 to 17.70
Silveries 8 per cent silicon	20.20 to 21.20

Coke.—It is reported that a majority of the furnaces in the Ironton district have closed for their coke requirements for the first half of next year, and it is generally believed that the prices paid do not exceed, in most cases, $3, ovens. The spot coke market is unsettled and prices vary according to the conditions of the sale. The market is probably a little easier, and the sales being made at present are mostly in small lots. There is a decided scarcity of coke, especially of furnace grades, in the Wise county and Pocahontas districts. Foundry coke in all cases is strong, and business at present is mostly for spot or nearby delivery. We quote:

Connellsville district:	Prompt shipment.	Contract.
Foundry coke	$4.25 to 4.75	$3.75 to 4.00
Furnace coke	3.85 to 4.25	3.00 to 3.50
Wise county district:		
Foundry coke	$4.00 to 4.25	$3.75 to 4.00
Furnace coke	3.50 to 4.00	3.25 to 3.75
Pocahontas district:		
Foundry coke	$3.75 to 4.00	$3.25 to 3.75
Furnace coke	3.25 to 3.75	2.75 to 3.00
New River:		
Foundry coke	$3.75 to 4.25	$3.25 to 3.75
Furnace coke	3.25 to 3.75	2.75 to 3.00

Finished Material.—The local sheet market is very strong, and although the local mill advanced its prices last week slightly above the present market quotations, it has been receiving business at these figures, which are as follows: Black No. 28 gage, 2.35c and galvanized No. 28, 3.50c, both Pittsburgh basis, with delivery to begin within from six to eight weeks from the date of sale. There is a good demand from jobbers, who are apparently short of supplies. Steel bars are quoted at from 1.40c to 1.45c, and structurals at from 1.45c to 1.50c, Pittsburgh.

Warehouse business continues good and the recently advanced prices of some of the local houses are holding firm. There are not enough stocks on hand to supply the demand, and dealers are not able to replenish them. There is no prospect of a let-up in business before the first of the year, if then. We quote below warehouse prices, f. o. b. Cincinnati, as follows:

Steel bars, 2c to 2.10c base; iron bars, 1.95c to 2.05c base; structurals, 2.10c to 2.20c base; plates, ¼ inch and over, 2.10c to 2.20c base; sheets, blue annealed, No. 10, 2.25c to 2.35c base; rivets, cone head, 2.60c to 2.70c base; cold rolled shafting, 58 per cent discount; steel hoops, 2.10c to 2.20c base; full extras; boiler tubes as follows: 1½ inch, 46 per cent discount; 1¾ to 2¼ inch, 57 per cent discount; 2½ inch, 60 per cent discount; 2¾ to 3¼ inch, 65 per cent discount; 3½ to 4½ inch, 68 per cent discount; 5 to 6 inch, 60 per cent discount; soft steel cold twisted concrete bars, cut to length as follows: ¾ inch square and larger, 2.15c to 2.25c; ⅝ inch square and larger, 2.25c to 2.35c; ½ inch square and larger, 2.35c to 2.45c; 5-16 to ⅜ inch square and larger, 2.55c to 2.65c; and ¼ inch square and larger, 2.65c to 2.75c.

Old Material.—The market continues weak and several prices have been lowered within the past few days. Cast iron scrap especially has weakened recently, and is now quoted lower proportionately than some of the other grades. Brokers and users of scrap are taking advantage of the condition of the market and are not offering any inducements that would justify the dealers in advancing their quotations. Cast borings are given 50 cents a ton lower than last report and mixed cast is being held at $10.25 to $10.75 per net ton regardless of the efforts of dealers to retain the former quotations of from $10.75 to $11.25. We quote below prices dealers will pay and also dealers' selling prices in Cincinnati and vicinity as follows:

Gross Tons

Old iron rails	$14.00 to 14.50
Old steel rerolling	12.25 to 12.75
Old iron axles	18.50 to 19.00
Heavy melting scrap	12.25 to 12.75
Relaying rails	21.50 to 22.00
Bundled sheet scrap	9.25 to 9.75

Net Tons

Old No. 1 R. R. wrought	$11.50 to 12.00
No. 1 machinery cast	11.75 to 12.25
No. 1 busheling	9.75 to 10.25
Stove plate	8.50 to 9.00
Machine shop turnings	7.75 to 8.25
Cast borings	8.00 to 8.50
Heavy turnings	8.25 to 8.75
Mixed cast	10.25 to 10.75
Malleable	8.00 to 8.50

PHILADELPHIA

Heavy Consumption in the East

Office of THE IRON TRADE REVIEW,
Philadelphia, Nov. 26.

Eastern steel makers are gaining no headway against the heavy tonnages they have banked upon their books and deliveries are still gradually falling back. New business is good. One eastern steel company is inquiring for 21,000 tons of plates and the large Norfolk & Western inquiry for 43,600 tons of finished material is unclosed. Pig iron seems to have reached a stationary point in price, except in the special grades. The market is firm, however, and shows no signs of weakening. An eastern steel company, rarely a buyer, took a block of basic in the week to supplement its own make. This shortage reflects the heavy operations of this interest. Some grades of scrap, including heavy steel, still show weakness, but others are holding their own.

Pig Iron.—A more nearly stationary market is ruling on pig iron in the eastern Pennsylvania district and the very evenness of conditions is causing some sellers to scan things more closely. In no particular, however, is there any appearance of recession in prices, which are firm and generally strong. In the more special irons, some further advance is noted. Producers without exception are optimistic and are not disposed to sell beyond the first half. As previously reported, however, some last half sales of low phosphorus have been closed. An interesting incident of the market is the appearance in the market for basic of a large eastern steel company which usually is not a buyer. This company took 5,000 tons of prompt basic to make up shortages in its own furnace output at a shade below $18.25, delivered, to a central Pennsylvania point. This business was divided between an eastern and a western Pennsylvania maker. Further sizeable lots of standard forge have been sold to eastern rolling mills. One mill in the week took two lots of 5,000 tons of forge for nearby delivery, one at $17.75, delivered, and the other at about $17.50, delivered. In both cases the furnace price was about $17. Recent sales of standard forge by one Lehigh valley furnace interest have reached 15,000 to 20,000 tons. The Baldwin Locomotive Works in the week took 1,500 tons of low grade iron from an eastern furnace for early delivery. A Delaware river pipe maker has out a new inquiry for 3,000 tons of forge and No. 3 for February-March shipment. A Virginia pipe shop took 3,000 tons of forge and No. 3, for first quarter, from Virginia furnaces. Standard foundry prices are little changed and for forward delivery hold closely to $18.50, Philadelphia, for No. 2X, or about $17.75, furnace. For early delivery, $18.25, delivered, can still be done and this price is being shaded slightly in some cases on less well-known brands where new capacity is going in. A Trenton consumer has closed for 1,500 to 2,000 tons of No. 1 and No. 2 plain, for early shipment, and some of this business is reported to have gone to Virginia. The B. & O. railroad has not closed its inquiry for approximately 2,000 tons. Some scattered sales of standard low phosphorus aggregating less than 1,000 tons are reported at prices equivalent to $24 to $24.50, Philadelphia. Recent contracts in this grade reported include the requirements of a large eastern steel maker for about 1,000 tons monthly. Leading makers of standard low phosphorus have sold freely beyond first half at ruling prices and are now committed on about 80 per cent of their next year's make. The Everett, Pa., furnace has gone in on foundry. The Tidewater stack is preparing to make some malleable.

We quote for early delivery to consumers' plants in Philadelphia and vicinity as follows:

Eastern Pa. No. 1X foundry	$18.50 to 18.75
Eastern Pa. No. 2X foundry	18.25 to 18.50
Eastern Pa. No. 2 plain	18.00 to 18.25
Standard forge (Eastern Pa.)	17.50 to 17.75
Basic (Eastern and Central Pa.)	18.00 to 18.25
Virginia No. 2X	18.65 to 18.80
Southern No. 2	18.25 to 18.75
Malleable	19.50 to 19.75
Low phosphorus, Philadelphia	24.00 to 24.50

(First Quarter.)

Malleable	$19.50 to 19.75
Basic	18.00 to 18.25
Eastern Pa. No. 2X foundry	18.25 to 18.50
Eastern Pa. No. 2X plain	18.00 to 18.25
Standard forge (Eastern Pa.)	17.50 to 17.75
Virginia No. 2X	18.65 to 18.80
Low phosphorus, Phila	24.00 to 24.50

Iron and Steel Bars.—Eastern makers report good tonnages of common iron bars taken for first quarter delivery at 1.75c, eastern Pennsylvania mill. The strong demand for bar iron and iron mill products continues. There is no relief to the congestion on deliveries with the steel bar mills and some eastern consumers are suffering from shortages. Deliveries still run into many weeks. Small lots of prompt steel bars are selling at from 1.85c to 1.95c, Philadelphia. The Panama Canal Commission paid about $6 a ton premium, not including extras, over the 1.40c base, Pittsburgh, for 500 to 600 tons of twisted bars closed in the week for delivery at the Isthmus in 50 days. The business went to the Concrete Steel Co. and the Philadelphia Steel & Wire Co.

We quote for delivery to consumer's plants in Philadelphia and vicinity: Steel bars at 1.55c to 1.60c on contract and common bar iron at 1.67½c to 1.77½c. Prompt steel bars on mill shipments are quoted at 1.85c to 1.95c and from store are quoted at 2c to 2.15c. Cut nails are quoted from $1.85 to $1.90, Philadelphia.

Shapes and Plates.—An inquiry for 21,000 tons of plates for first half delivery for an eastern steel maker is before producers. The large inquiry for 43,600 tons of plates, shapes and bars for car construction for the Norfolk & Western railroad is still unclosed. Both of these buyers are encountering the practical impossibility of getting such heavy tonnages of material for the deliveries specified, from the sold-up larger mills. The smaller producers, as a rule, do not care to obligate themselves on such tonnages. Eastern plate makers are entering new business in the same heavy volume and are out of the market on sizeable lots for this year. Their schedules remain on a minimum of 1.60c, Pittsburgh, for sheared, and 1.65c, for universals. Structural shape tonnage is also coming to eastern makers very liberally and deliveries have lengthened from 10 to 12 weeks on fresh orders with prices at 1.60c, Pittsburgh minimum. Small prompt lots are offered by one or two mills at premiums. Wells Bros. have the general contract for the Tutweiler apartment, Birmingham, Ala., but the 2,000 tons of steel are unplaced. The Virginia Bridge & Iron Works are expected to fabricate the extension of the car shops of the Norfolk & Western railroad at Roanoke. The Pennsylvania railroad is inquiring for 500

to 1,000 tons of shapes for steel coach construction at Altoona. Plans are being prepared for the Peoples' Bank building, Lynchburg, Va.

We quote delivered to consumer's plants in Philadelphia and vicinity: Sheared steel plates, 1.65c to 1.75c; universal steel plates, 1.65c to 1.80c; structural shapes, 1.65c to 1.80c. Plates and shapes from store are quoted at 2.15c to 2.25c.

Sheets. — The demand for sheets from eastern buyers continues to expand and is very heavy. Deliveries with eastern makers are still falling back and one leading Schuylkill valley producer is now quoting six weeks. Sales continue to be made at 1.90c, Pittsburgh, or 2.05c, Philadelphia, and higher for No. 10 gage blue annealed.

We quote for delivery to consumer's plants in Philadelphia and vicinity, No. 10 gage blue annealed sheets at from 1.95c to 2.05c.

Semi-Finished Steel.—Eastern Pennsylvania steel makers who have been sellers of crude material in the recent past continue to receive inquiries for billets and slabs, but are unable to satisfy them. Consumers are willing in the present stringency to take in most any kind of steel at high prices as is shown by a sale of less than 500 tons of misfit billets at $29.50, eastern Pennsylvania delivery.

We quote delivered to consumer's plants in Philadelphia and vicinity 4 x 4-inch open-hearth and Bessemer rolling billets at $28.50 to $30.50 and forging billets at from $34.50 to $38.50.

Old Material.—The spotty condition of the old material market is unchanged, with some grades showing weakness, while others, strength. In heavy cast, slight advances have been made. The market lacks the support of active buying and manifests more or less uncertainty. Heavy melting steel in small lot sales is clearly lower. One steel maker picked up approximately 5,000 tons of heavy steel in scattered purchases slightly below $15.50, delivered. At the moment $15.50, delivered, appears to be maximum. No. 1 wrought is 25 cents lower. Borings are in good demand. Sales of wrought pipe at $14, delivered to brokers, and $14.25, to the mills, are reported.

We quote gross tons delivered to consumers' plants in eastern Pennsylvania and western New Jersey, as follows:

Old iron rails	$18.50 to 19.00
Old steel rails (rerolling)	17.00 to 17.50
No. 1 heavy melting steel	15.25 to 15.50
Old car wheels	15.00 to 15.50
Old iron axles	24.00 to 25.00
Old steel axles	19.50 to 20.50
No. 1 railroad wrought	17.00 to 17.50
Wrought pipe	14.00 to 14.50
Cast borings	11.50 to 12.00
Machine shop turnings	11.50 to 12.00
Heavy cast (broken)	15.00 to 15.50
Malleable	13.50 to 14.00
Stove plate	11.50 to 12.00
No. 1 forge	14.00 to 14.50
Low phosphorus	19.50 to 20.00

BIRMINGHAM

Decidedly More Interest in Pig Iron

Office of THE IRON TRADE REVIEW, Birmingham, Ala., Nov. 26.

Pig Iron.—An aggregate of 10,000 tons is reported sold in this market during the week just ended, of which one lot of 5,000 tons is for immediate exportation to Italy. This last is reported as entered at $14.50 per ton, Birmingham, for No. 2 foundry, while the prices received for the remainder of the tonnage sold in the week vary from a basis of $14 to that of $15 per ton. With the exception of the export requirement, comparatively small lots to meet urgent demands were the principal considerations, and the prices paid necessarily resulted from the local furnace conditions. As to advanced delivery, the attitude of the several producing interests is no more definitely known. From the information obtainable, only one large concern is soliciting tonnage for shipment after the first quarter, and the prices being made are understood to be on a $15, Birmingham basis. That such figures are not attractive to the trade is indicated by the sales reported, yet it is not believed that any tonnage has been offered at lower figures.

It has been rumored that a certain brand, and of which there is more or less accumulation on furnace yards, could be had in competitive territory at a concession from a $14, Birmingham basis, but subsequent developments have not confirmed such reports, and the only concession known to have been made by any local concerns was probably a slight freight advantage. Taken altogether, there is no apparent reason why the market should be forced in any quarter. As has been shown, the daily movement (when equipment can be had) is larger than the output, and the additions to the production that have been proposed are still a matter of speculation. Without additions to order books, the present rate of production is no doubt well taken care of for some three months, and it has not been shown that the trade is covered to a greater extent. Decidedly more interest has been manifested by the trade in the past fortnight, and at present some 7,500 to 10,000 tons for second quarter delivery are pending in definite form. The most significant requirements now before the selling interests are 3,000 tons of special analysis iron, 3,000 tons of No. 2 foundry, 3,000 tons of gray forge, and 1,000 tons of No. 2 foundry, All of this tonnage is wanted for delivery extending well into the first half, and the smaller requirements for earlier shipment are attractive in the aggregate. This last involves No. 4 foundry, gray forge and mottled, principally, as the supply of those grades has been less than the demand for some time past, notwithstanding the comparative inactivity of the market. In practically all cases, such tonnage of low grades as can be offered is being held strictly at a differential of 25 cents per ton on the No. 2 foundry price, although at a basis of $15 per ton for the second quarter, it is understood that the usual differential of 50 cents per ton for the low grades would apply. With the market comparatively quiet, and those parties concerned most interested in the delivery of tonnage already engaged, the status of prices is unchanged. We quote as below, for delivery prior to the beginning of the second quarter, per gross ton, f. o. b. cars at Birmingham furnaces, viz.:

For delivery during the remainder of this year and first quarter next:

No. 1 foundry	$14.50 to 15.00
No. 2 foundry	14.00 to 14.50
No. 3 foundry	13.75 to 14.25
No. 4 foundry	13.50 to 14.00
Gray forge	13.25 to 13.75
Basic	14.00 to 14.50
Charcoal	23.00 to 23.50

With the exception of charcoal iron, an advance of 25c to 50c per ton would be asked over the above figures for deliveries in the last quarter.

Old Material.—Dealers report an advance of 50 cents per ton for light cast and stove plate, and the asking prices for the other grades handled are revised as below. The buying has been along more conservative lines in the past week, but the tonnage being moved is very substantial. The prices dealers are now asking for their holdings are about as follows, per gross ton, f. o. b. cars at Birmingham, viz.:

Old iron axles (light)	$15.50 to 16.00
Old steel axles (light)	15.50 to 16.00
Old iron rails	15.50 to 16.00
No. 1 R. R. wrought	13.00 to 13.50
No. 2 R. R. wrought	11.50 to 12.00
No. 1 country	10.00 to 10.50
No. 2 country	9.00 to 9.50
No. 1 machinery	11.50 to 12.00
No. 1 steel	11.00 to 11.50
Tram car wheels	11.00 to 11.50
Standard car wheels	13.00 to 13.50
Light cast and stove plate	10.00 to 10.50

The Standard Steel Car Co.'s works at Butler, Pa., are being improved by the installation of a new 1,000-ton press.

NEW YORK

Canadian Buyer Takes Large Tonnage

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg., Nov. 26.

Iron Ore. — Port Henry iron ore prices for 1913 delivery have been established by Witherbee, Sherman & Co., Inc., and the Port Henry Iron Ore Co. on the basis of 1911 prices, which is equivalent to an advance of about 50 cents a ton over the present year. The great portion of the output of the Port Henry district for next year has already been taken up on contracts and new reservations. Lake Superior ore sellers sold large tonnages of that material to eastern consumers during the past week at the new schedule of prices and terminated the outstanding reservations. Little foreign ore of any character is now being offered in the east. Cuban miners will not accept 8 cents per unit tidewater for Diaquiri ore at present. It is possible that some Spanish ore might be brought out on 8½ cents per unit, tidewater, but the tonnage would be limited.

Pig Iron. — The Canadian Car & Foundry Co., which has been inquiring on this side for a large tonnage of pig iron, has closed for about 20,000 tons of basic, malleable and foundry grades for forward shipment with Buffalo makers at prices ranging from $17.50 to $18, furnace, which are equivalent to from $22.25 to $22.75 at the principal delivery point. On the whole, however, the market in this district during the past week has been very dull on new buying. Consumption, to all appearances, is continuing at large proportions. A number of consumers have been importuning makers to anticipate next year's contracts, by making partial shipments for this year, but they usually have not been accommodated, as the furnaces are finding it hard to keep up their regular shipments. The largest sale reported in the week calls for 2,000 tons of Buffalo iron for first quarter. Present inquiry is very light. Prices are stationary but firm. Eastern Pennsylvania No. 2X continues quotable at from $18.25 to $18.50, tidewater. A leading Buffalo furnace interest, which had been holding No. 2X at a minimum of $17.25, furnace, withdrew entirely from the market in the week. The leading Virginia interest is still out of the market on No. 2X iron, but is still offering the lower grades at the regular differentials below the former No. 2X price of $16, furnace. A sale of 300 tons of low phosphorus iron at $22, New York furnace, equivalent to $24.50, Philadelphia, is noted. This grade continues very strong. Lebanon low phosphorus is now nominally quoted at $20, furnace, but the largest sellers are still out of the market. The Maryland Steel Co. has advanced its price of Mayari pig iron from $22 to $23, Sparrows Point. We quote for prompt and forward delivery, New York tidewater, as follows:

Northern foundry No. 1	$18.50 to 18.75
Northern No. 2X foundry	18.25 to 18.50
Northern No. 2 plain	18.00 to 18.25
No. 2 Virginia	18.80 to 19.20
No. 2 southern foundry	18.50 to 18.75
Malleable	19.00 to 19.25
Gray forge	17.50 to 17.75

(First Quarter.)

Northern No. 2X foundry	$18.25 to 18.50
Northern 2 plain	18.00 to 18.25
No. 2X Virginia	18.80 to 19.20
No. 2 Southern	18.50 to 18.75

Ferro-Alloys. — Conditions in the ferro-manganese market are leading some sellers of this material to expect that an advance for forward delivery is not far distant. At the present time, practically no contract is available for first half and considerable tonnage has been booked for second half delivery at the regular price of $61, seaboard. Prompt ferro-manganese is very strong. A sale of several hundred tons at $73, seaboard, is noted. Several carload inquiries for 50 per cent ferro-silicon are current. The large order for ferro-alloys for the United States Steel Corporation, which was referred to last week as practically closed, has been finally placed with domestic makers.

We quote standard English 80 per cent ferro-manganese at $73 to $75, seaboard, for early shipment and at $61, seaboard, for delivery after Jan. 1 and 50 per cent ferro-silicon on contract at $75, Pittsburgh or Philadelphia, for carloads, $74, for larger lots, and $73, for 600 tons or more.

Plates.—Eastern makers of plates and those smaller mills able to make deliveries in from five to eight weeks, continue to book new business steadily at a range 1.60c to 1.65c, Pittsburgh, or 1.76c to 1.81c, New York. Lower prices offered by larger makers apply chiefly to contracts to begin some months hence. Large buyers now on the market for round blocks of plates for first half are having great trouble to obtain the quantities and deliveries asked. A large number of cars continue under negotiation but announcements of awards are less numerous. Some car shops are being restrained from running to full capacity, although they have the work on hand, by their inability to get deliveries upon their complete steel requirements.

We quote, delivered at New York tidewater on going business, for last quarter or first quarter, 1.76c to 1.86c New York, on sheared plates. Some makers are asking $1 higher for universal plates. Plates from store are quoted at 2.15c.

Structural Shapes. — A New York firm of importers has circularized the local structural trade to ascertain the present market possibilities for the importation of German steel beams under present conditions. This effort has shown that the opportunity for bringing in German beams today consists chiefly of small lots for quick shipment at premium prices, since some offerings can be made for about six week's delivery at around two cents tidewater. German mills are now well filled from their regular trade and do not care to tender large tonnages. Deliveries on shapes with eastern mills still run from 10 to 12 weeks and show no improvement. Thus mills are selling ahead with caution, though 1.60c Pittsburgh or 1.76c, New York, is readily obtainable. Pittsburgh mills are not strong competitors for new business, despite their lower quotations, because of their extended shipments.

In awards, the market shows no great briskness. Milliken Bros. have 1,600 tons for the addition to the Rhinelander building, this city, Levering & Gerrigues, 250 tons for an apartment at West Fifty-seventh street. Independent shops have taken 300 tons for a building for the American Securities Smelter Co., Baltimore, and 400 tons for a bridge for the New York & Long Branch Railroad, at Morgan, N. J.

The New York Central Lines in the week took bids for a number of bridges, aggregating 2,400 tons and also for two additional terminal areas, this city, to require 2,000 tons. Plans are out to close Nov. 29 for the Consolidated Gas Co. building, Fifteenth street and Irving Place, 2,-

500 tons; for the improvement of Manhattan plaza of Manhattan Bridge through the bridge department of the city, 1,200 tons to close Dec. 19; for department store for Stewart & Co., Baltimore, 1,000 tons. Geo. F. Payne, Philadelphia, has the general contract for the Widener memorial library, Boston, about 1,000 tons. The Stevens building, Chicago, is being refigured. Plans will soon be out for a New York Central passenger station, Utica, N. Y. The Boston & Maine Railroad has up 400 tons for bridges and 350 tons for canopies of the new station at Lynn, Mass.

We quote for New York delivery as follows: Structural shapes, 1.66c to 1.76c. Structural shapes from store, 2.15c.

Iron and Steel Bars. — Consumers of steel bars continue to encounter difficulty in getting deliveries from the mills and some of them are turning to iron bars which action is bringing a more active market in that product. Prompt steel bars are commanding from 1.90c to 2 cents tidewater for small lots. Common bar iron continues to bring from 1.60 to 1.70, eastern mill, and some higher prices have been gained by producers.

We quote for New York delivery, steel bars at 1.56c and common iron bars at 1.65c to 1.70c. Steel bars from store are quoted at 2 cents.

Rails and Track Materials.—Several rail orders of good size have been practically closed in the eastern market. The Philadelphia & Reading system has also taken a supplemental lot of 10,000 tons, from a nearby mill. It develops that the recent Lehigh Valley rail order was heavier than reported and reached about 50,000 tons. The division of this order gave 20,000 tons to the Bethlehem Steel Co. and 10,000 tons each to the Pennsylvania, Carnegie and Cambria Steel companies. The division of the 65,000-ton order for the New Haven system, which was reported some weeks ago, gives 25,000 tons each to the Pennsylvania Steel Co. and the Bethlehem Steel Co. and 15,000 tons to the Lackawanna Steel Co. An export inquiry for 1,400 tons of tee rails for Chili is pending. Many of the leading eastern railroad systems have been liberal buyers of spikes and other track fastenings during the past several months. In spikes, they are now pretty well covered and smaller lots are moving, upon which makers are having no difficulty to obtain 1.90c, Pittsburgh, for standards and 2c for small spikes. The Baltimore & Ohio railroad was the recent purchaser of 50,000 kegs.

Cast Iron Pipe.—American cast pipe makers have again been approached with a large requirement of pipe for export to Montreal amounting to 30,000 tons or more. The specifications diverge considerably from American practice, however, which reduces the chances of American shops obtaining the order. Another export inquiry current calls for 1,000 tons for shipment to the West Indies. Public lettings include 835 tons for Washington, D. C., closed Dec. 6, and 630 tons of 6-inch and larger for New Bedford, Mass. The market is less active on new business, but the shops are well filled with orders. Prices are stronger, but some quotations were recently made at $22, eastern Pennsylvania shops.

We quote six-inch pipe at from $24 to $26, f. o. b. New York, in carload lots.

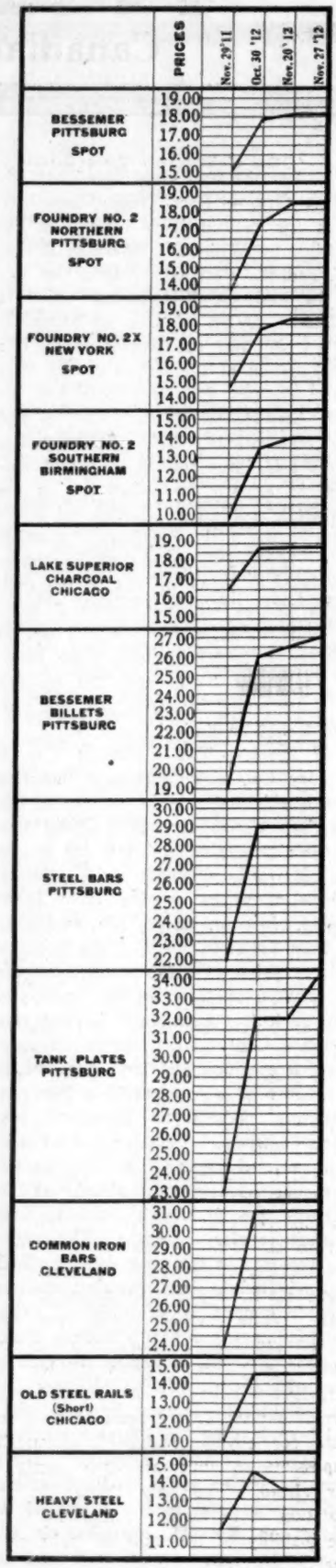
Old Material. — Announcement is made that the large stock of old material embracing 45,000 to 50,000 tons of all grades, of the Albany Waste & Metal Co., Albany, N. Y., will be offered for sale to the highest bidder Dec. 3. This stock has been accumulating over several years and is said to be one of the largest in a dealer's hands in the country. In all, 77 lots of material are involved. The market shows a better tone this week, and there is a little more active buying. The steel mills in eastern Pennsylvania and the leading rolling mill consumers, however, continue to offer only prices which are below the ideas of dealers. Borings are well maintained through a local demand. We quote, gross tons, prices New York dealers will pay at tidewater, as follows:

Old car wheels	$13.50 to 13.75
Old iron axles	22.00 to 22.50
Steel axles	17.00 to 17.50
Old steel shafting	16.50 to 17.00
No. 1 heavy melting steel	13.00 to 13.25
No. 1 R. R. wrought	14.50 to 15.00
Wrought pipe (not galvanized)	11.25 to 11.50
Cast borings	9.50 to 10.00
Machine shop turnings	9.75 to 10.00
Heavy cast	11.75 to 12.25
R. R. malleable	10.50 to 10.75
Stove plate	9.25 to 9.50
Grate bars	8.25 to 8.50

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City, and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixvile, Pa., and Reading, Pa., $1.50 from Jersey City, and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City, and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City, and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York; to Jersey City, $1.00 from New York; to Newark, $1.10 from New York

Must File Claims. — All claims of creditors of Allis-Chalmers Co., Milwaukee, Wis., must be filed with the clerk of the United States court at Milwaukee, on or before Feb. 13, 1913, according to an order issued by Judge F. A. Geiger, in response to a petition of the receiver, Gen. Otto H. Falk, in the action of the First National Bank, the Wisconsin National Bank, Milwaukee, and W. W. Nichols.

PRICE CHART



BUFFALO

Pig Iron Prices Again Advanced

Office of THE IRON TRADE REVIEW,
Buffalo, Nov. 26.

Pig Iron.—Prices have again advanced in this district and the market remains rigid at the new level established by the schedule indicated below. The placement for the week amounted to upwards of 20,000 tons in foundry grades, malleable, basic and charcoal irons, the latter amounting to about 7,000 tons. It is also reported that a Canadian foundry interest ordered here, 10,000 tons of basic and 10,000 tons of malleable. One furnace is practically out of the market until after the opening of the second quarter of next year, is holding $18 as a minimum on all grades, and has instructed its sales representatives that no orders will be accepted without reference to head office for confirmation. Shipments continue heavy on contract orders, taxing the full capacity of the furnaces and the ability of the roads to furnish cars. There is no apparent improvement in the coke situation, an urgent demand being reported from all quarters. The range for the week, f. o. b. furnace, is substantially as follows:

No. 1X foundry	$18.00 to 18.25
No. 2X foundry	17.75 to 18.00
No. 2 plain	17.50 to 17.75
No. 3 foundry	17.25 to 17.50
Gray forge	17.00 to 17.25
Malleable	18.00 to 18.25
Basic	18.00 to 18.25
*Charcoal	18.25 to 19.25
*Some grades and brands	22.00

Finished Material. — The market continues absolutely firm with no change of prices indicated for the week. Most of the mills report the delivery situation as worse than ever; third quarter being the best obtainable on structural, from 6 to 8 months on bars, and from 4 to 5 months on hoops, where from 3 to 4 months was previously possible. Every mill in the district is being worked to the limit of its capacity and ability to get semi-finished steel. Specifications continue to pour in freely, but not to as great an extent as in July, August, September, and October. This slight slackening is considered seasonable. While the November specifying is not up to that of these former months, it is far in excess of November, 1911. Mills are scheduled so far ahead that the buyers seem to be losing taste for buying, finding it practically impossible to anticipate their needs so far ahead. The only change in the situation is to further complicate it by the inability of the mills to make reasonable deliveries. With most interests there is no inclination to open their books for new business, even with contract customers, until the present heavy tonnage obligations are reduced.

Bids will be opened Friday, by Colson & Hudson, architects for the new Foster-Milburn Co. building, Buffalo, requiring about 300 tons; on the same day the city of Buffalo will open bids for the new Hutchinson high school, requiring 1,400 tons, H. Osgood Holland, architect; and in the middle of December bids will be opened by the city for Masten Park high school, also requiring about 1,400 tons, Esenwein & Johnson, architects. The Buffalo Structural Steel Co. secured the contract for the steel in the addition to the Crosby Co. plant, Buffalo, 100 tons.

Old Material.—The local scrap dealers report a lighter volume of business for the past week than was transacted during the previous one, but say that the melters of the district continue to buy various lines in limited lots. The falling off in tonnage has had no apparent influence on the range of prices. These remain as firm as ever. For gross tons, f. o. b. Buffalo, the following schedule represents the market:

Heavy melting steel	$14.75 to 15.25
No. 1 railroad wrought scrap	15.75 to 16.25
No. 1 R. R. and mch. cast sc'p	14.00 to 14.50
Old steel axles	16.00 to 16.75
Iron axles	23.50 to 24.00
Car wheels	15.50 to 16.25
Railroad malleable scrap	13.75 to 14.25
Wr'ght iron and soft steel turn.	8.75 to 9.00
Cast iron borings	8.00 to 8.50
Low phosphorus steel scrap	17.00 to 17.50
Old iron rails	15.50 to 16.00
Tank iron	10.75 to 11.25
Boiler plate, sheared	15.00 to 15.50
Pipe and tank	10.50 to 11.00
Stove plate	11.25 to 11.75
Sheet iron	7.75 to 8.25
Locomotive grate bars	11.75 to 12.25

ST. LOUIS

Melters Request Anticipation of Shipments

Office of THE IRON TRADE REVIEW,
St. Louis, Nov. 26.

Pig Iron.—Shipments of pig iron were good last week, buyers ordering iron sent ahead of the contract date. Inquiries are in the market for 1,000 to 1,500 tons of 50 per cent ferro-silicon for next year's delivery; 100 tons of southern No. 1 soft, 100 tons of No. 4 southern foundry, and about 1,000 tons of various grades in small lots for spot shipment. Sales last week and today include 500 tons of ferro-manganese, 1,000 tons of foundry grades in small shipments, 500 tons of southern No. 2 soft for first quarter delivery, 200 tons of southern No. 2, and 300 tons of southern No. 3. Southern No. 2 is firm at $14, for spot shipment, and at $14.50, for first quarter and first half of next year, with some sales agents asking $14.50 for spot and $15 for next year's delivery. Northern iron is firm at $18, f. o. b. Chicago furnace, and at $17, f. o. b. Ironton. Prices on southern iron, delivered, to which the Birmingham freight of $3.75 has been added, follow:

Southern No. 1	$18.25 to 19.25
Southern No. 2	17.75 to 18.75
Southern No. 3	17.50 to 18.50
Southern No. 4	17.25 to 18.25

Coke.—Considerable difficulty is experienced in getting coke, the demand is strong, and prices are unchanged as follows:

We quote 72-hour Connellsville foundry grades, $4.50 for immediate shipment or delivery through the year; 48-hour Connellsville furnace, $4.00; best 72-hour Virginia foundry, $3.75 to $4.00; 48-hour Virginia furnace, $3.25 to $3.50. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Old Material.—All grades of scrap are in fairly active demand, especially relayers, and some good business is expected soon. There are no lists out today. Prices which dealers are willing to pay f. o. b. St. Louis, follow:

Gross Tons

Old car wheels	$15.00 to 15.50
Old iron rails	15.50 to 16.00
Rerolling rails (5 ft. and over)	16.00 to 16.50
Old steel rails (3 ft. and und.)	14.50 to 15.00
Light section relayers (45 lbs. and under, subject to inspec.)	24.00 to 25.00
Relaying rails, subject to insp.	24.00 to 25.00
Frogs, switches and guards cut apart	15.00 to 15.25
Heavy melting steel	14.75 to 15.25
Shoveling steel	12.50 to 13.00

Net Tons

No. 1 railroad wrought	$13.00 to 13.50
No. 2 railroad wrought	12.50 to 13.00
Arch bars and transoms	15.50 to 16.00
Knuckles, couplers and springs	12.50 to 12.75
Shafting	17.00 to 17.50
Iron car axles	20.00 to 21.00
Steel car axles	17.50 to 18.00
Locomotive tires	13.50 to 14.00
Pipes and flues	9.00 to 9.50
Tank iron and cut boilers	9.00 to 9.50
No. 1 cut busheling	11.00 to 11.50
No. 2 cut busheling	9.50 to 10.00
Cast and mixed borings	7.25 to 7.75
Machine shop turnings	8.75 to 9.25
Railroad malleable	12.00 to 12.50
Agricultural malleable	10.50 to 11.00
Stove plates	10.00 to 10.50
Angle splice bars (iron)	13.50 to 14.00
Angle splice bars (steel)	12.50 to 12.75

METAL MARKETS

Copper Sales Below Expectations

Chicago

Nov. 25.

New Metals.—The market for new metals exhibits a rather spotted condition, casting copper being stronger and both lead and spelter giving out lower quotations. The demand is also brisk for this time of the year.

We quote dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 17⅝c; casting, 17½c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 7.40c; lead, desilverized, 4.75c; sheet zinc, 9c, f. o. b. Lasalle, in car lots of 600-pound casks; pig tin, 49.62½c; Cookson's antimony, 10½c; other grades, 9¼c.

Old Metals.—Very few changes have been made during the week on the quotations on old metals and the demand continues at about the same rate.

We quote dealers' selling prices, f. o. b. Chicago, as follows:

Copper wire, crucible sheets, 17c; copper bottoms, 14½c; heavy red brass, 13¼c; heavy yellow brass, 10¼c; No. 1 red brass borings, 12½c; No. 1 yellow brass borings, 9.25c; brass clippings, 10½c; lead pipe, 4½c; zinc scrap, 5½c; tea lead, 4c; No. 1 aluminum, 20c; No. 1 pewter, 36c; block tin pipe, 47c; tin foil, 40c; linotype dross, 3½c; stereotype plates, 4c; stereotype dross, 3.50c; prime slab zinc dross, $131 a ton.

New York

Nov. 26.

Copper.—The indications that copper consumers were preparing to enter on an active buying campaign, which appeared in the trade last week, proved disappointing. Sales fell far short of what was expected would take place. It now appears that domestic consumers are moving cautiously in replenishing their stocks, anticipating a large increase in the statistical surplus at the end of November. The leading sellers, however, are holding their quotations firm at 17.75c for electrolytic, delivered 30 days, and 17,87½c for lake. As metal in second hands, and the output of some of the smaller producers, is being offered ⅛c under those figures it is not likely that the high quotations are more than nominal. Inquiry from Europe has also fallen off considerably from last week.

Tin.—The London standard tin market fluctuated between £227 15s and £225 15s the past week, and closed today midway of the two extremes. Domestic buyers have been fortunate in that sellers here have shown a disposition to let the metal go at slight concessions from the equivalent of foreign quotations. In the outside market the metal is offered at 49.75c, including all positions up to Jan. 1, 1913. Arrivals since Nov. 1 aggregate 3,251 tons and there are 815 tons afloat.

Lead.—Offerings by independent sellers have depressed the price 10 points from last week's closing. Recent sales were made at 4.52½c in New York. There is a noticeable decline in demand which, however, is normal for this time of the year. The leading seller continues to quote 4.75c for shipments to this territory.

Spelter.—The spelter market has been rather quiet at slightly lower prices than prevailed last week. Prime western is quoted at 7.55c in New York, and business is reported at from 7.50c to 7.45c.

Antimony.—Demand is light, and there is sufficient offering by dealers to hold prices below import quotations. Cookson's is 10.25c, Hallett's is 9.75c and other brands from 9c to 9.25c.

Resume Hearings on Ore Rate Complaint

The hearings were resumed Nov. 26 at Washington, in the Youngstown Sheet & Tube Co.'s ore freight rate complaint. A. M. Schoyer, general superintendent of the Pennsylvania Lines west, was on the stand. He put in about two dozen exhibits tending to show that J. P. Muller, who put in 40 odd exhibits, made 100 errors in computation; that his statistical work is not only misleading as to the bases, but absolutely worthless, owing to arithmetical inaccuracies. Mr. Schoyer also put in evidence glowing newspaper prospectuses which indicated that Youngstown is exceptionally prosperous. After reading one of them, he said that the rates instead of being lowered should be doubled if the assertions in the prospectus are accurate.

The foundry recently purchased by the Kretschmer Mfg. Co., Dubuque, Ia., will be completely remodeled and used as an iron and brass foundry.

NEW MEMBERS

Elected by Directors of American Iron and Steel Institute.

At the meeting of the directors of the American Iron and Steel Institute on Friday, 73 nominations were considered for membership in the institute. Of these five were passed over for the present and 68 were elected. The names of the newly elected members follow:

William M. Bailey, Pittsburgh.
Richard W. Bailey, Pittsburgh.
Duke N. Banks, Pittsburgh.
Joseph R. Bates, Pittsburgh.
Edward L. Billingslea, Chicago.
Louis E. Booth, New Haven, Conn.
Lee H. Bowman, Pittsburgh.
Edwin H. Broden, Rankin, Pa.
G. D. Chamberlain, Braddock, Pa.
Daniel M. Clemson, Pittsburgh.
Charles L. Close, New York City.
Frederick Crabtree, Pittsburgh.
David T. Croxton, Cleveland.
David Dows, New York City.
John Duncan, Wheeling, W. Va.
Robert Geddis, Pittsburgh.
Roland Gerry, Pittsburgh.
James H. Gray, New York City.
Howard M. Hanna Jr., Cleveland.
Charles N. Hickok, Cleveland.
Walter B. Higgins, Steubenville, O.
Kinney C. Hoxie, Duluth.
John W. Hubbard, Pittsburgh.
F. W. Hutchings, Detroit.
A. H. Hutchinson, Chicago.
William A. James, Buffalo.
James E. Jones, So. Chicago.
Richard Jones Jr., Youngstown, O.
John W. Kreitter, Proctor, Minn.
Augustan M. Lally, Pittsburgh.
Alex Laughlin Jr., Pittsburgh.
Charles McKnight, Pittsburgh.
Reuben E. McMahon, Cleveland.
A. K. McMillen, Pittsburgh.
William E. Manning, Youngstown, O.
Edwin S. Mills, Chicago.
Carl A. Meissner, New York City.
James G. Mustin, Braddock, Pa.
Albert D. Neal, Munhall, Pa.
George W. Niedringhaus, Granite City, Ill.
John S. Patterson, Pittsburgh.
William G. Pearce, New York City.
Chas. Page Perin, New York City.
Harry W. Petty, Pittsburgh.
James S. Phifer, Allentown, Pa.
Jose A. Ruiloba, New York City.
Wm. F. Rust, Youngstown, O.
Wm. T. Shannon, Cincinnati.
MacGilvray Shiras, Pittsburgh.
B. R. Shover, Youngstown, O.
James A. Smith Jr., Detroit.
George T. Snyder, McKeesport, Pa.
Chas. R. Sturdevant, Worcester, Mass.
Wm. J. Sullivan, New York City.
Benjamin Talbot, Middlesborough, Eng.
Charles D. Terry, Pittsburgh.
George Thomas, 3rd, Parkesburg, Pa.
J. Earlston Thropp Jr., Indiana Harbor, Ind.
David Tod, Youngstown, O.
Enrique Touceda, Albany, N. Y.
Francis L. Toy, Munhall, Pa.
Edward H. Utely, Pittsburgh.
John C. Vollman, Salem, O.
John C. Walker, New York City.
Walter E. Watson, Steubenville, O.
Wm. J. Wetstein, St. Louis.
Chas. Van Cise Wheeler, Washington, D. C.
Dwight E. Woodbridge, Duluth, Minn.

DON'T WORRY

Was Schwab's Advice to Business Men of Pittsburgh.

Pittsburgh, Nov. 26.—Charles M. Schwab, president of the Bethlehem Steel Corporation, and former president of the United States Steel Corporation, was one of the principal speakers last night at the annual banquet of the chamber of commerce of this city, held at Shenley hotel. During his visit in this city, Mr. Schwab was the guest of A. C. Dinkey, president of the Carnegie Steel Co.

"Many of the big industrial corporations need regulation and they are going to get it," said Mr. Schwab, at the opening of his address. "But you need not worry on that score," he added, in almost the same breath. "If you remember when the Interstate Commerce Commission first began its work the railroads raised a cry that their business was ruined. But such was not the case. It was probably one of the best things that ever happened to the railroads.

"So it is with the big industries, and you need not worry," continued the speaker. "All you need to do in Pittsburgh, the world's greatest industrial center, is to get together. Do not be afraid of every outcry of legislation.

"Some of the business men imagine that they already have regulation. Do not deceive yourselves. It is like the man whom the doctor ordered to cut out wine, women and song. When he next visited the doctor he said he had cut out the singing.

"I have found it much easier to manufacture steel than to borrow the money with which to manufacture it. I remember of going to a banker friend of mine in Philadelphia and asked him how much money I could borrow from his bank. He told me $200,000 or $300,000. I replied that it was not enough; that many bankers who did not know me would loan that amount.

" 'That's the reason', he replied, 'I know you'."

Henry A. Wheeler, president of the Chamber of Commerce of the United States, J. V. Davis, chief engineer of the Hudson & Manhattan railroad, and many of the prominent members of the chamber, gave interesting talks.

Reduces Receivers' Charges.—Special Commissioner William G. Mahaffy has filed a report in the local courts of Wilmington, Del., reducing the receivers' fees of the Diamond State Steel Co., of Wilmington, from $50,000 to $20,000, and making surcharges of $21,467.86. The master objected to the number of employes whose services were continued. Both creditors and receivers have filed exceptions.

EXPECT SETTLEMENT

Shortly of Labor Difficulties at Three Carnegie Plants.

Pittsburgh, Nov. 26.—Indications today pointed to an early settlement of the difficulties which resulted in a strike of about 500 trainmen at the Homestead and Edgar Thomson steel plants and the Carrie furnaces of the Carnegie Steel Co. The trouble arose over the discharge of one of the yard masters at the Homestead plant for disciplinary reasons, it being claimed that he was circulating a petition. It has since developed that the trainmen want higher wages, having voted to ask for the scale paid similar employes of the Union railroad.

Representatives of the strikers and officials of the company conferred late yesterday afternoon in an attempt to make a settlement and the employes have the matter of returning to work under consideration.

The wage question, however, has not been formally presented to the officials of the company. Regular mill employes are not included in the strike, but mill work has been somewhat interfered with.

LAND BOUGHT

By Otis Steel Co., Cleveland, as Site For New Plant.

The Otis Steel Co., Cleveland, which for some time has been considering the building of a new plant, has just purchased 200 acres in the upper Cuyahoga river valley. The company had been making efforts to secure additional land on the lake front near its present site, but these negotiations with the government and city were unsuccessful.

It is understood that an open-hearth plant of large capacity, as well as light and heavy plate mills, will be erected on the land just acquired. Eventually, the company proposes to erect blast furnaces along the new dock line which will be established when plans now under consideration for the dredging of the upper reaches of the Cuyahoga river are carried out. The disposition to be made of the present plant is not yet decided upon, but it will probably continue to be operated by the company for several years, at least.

MANY INNOVATIONS

Will Characterize Future Machine Tool Design, Mr. Bullard Predicts.

A special meeting of the Cleveland Engineering Society was held on Tuesday evening, Nov. 26, at the Chamber of Commerce building, Cleveland. The principal speaker was Edward Payson Bullard Jr., president of the National Tool Builders' Association and also president of the Bullard Machine Tool Co., Bridgeport, Conn. Mr. Bullard's talk was on "The New Era in Machine Tool Design," and as presented by him, constituted a most interesting subject. It was stated that this is an age of accuracy and exact knowledge, and that the machine tool is a great factor in the development of modern civilization. According to Mr. Bullard, machine tools, as a rule, have not changed greatly in general design, for many years, and therefore, opportunity exists for much improvement. One feature that should receive particular attention of builders is the matter of control. The operator of a machine, he said, should not be called upon to oil and move heavy parts; this work should be done by power, otherwise the machine is inefficient.

In the consideration of an efficient, successful machine, the following points should be kept in mind: Productibility, durability and adaptability. Mr. Bullard, in discussing these three essentials, related the results of time tests that he had conducted on several occasions, bringing out some interesting points and showing that much of the operator's time in every shop is consumed in doing unnecessary work, that in reality could and should be performed by power appliances on the machine itself. It is his belief that the machine tools of the future, if they are to be successful and their makers are to thrive, must embody such innovations as the more extensive use of alloy steels, flooded lubrication, gear drives similar to those employed in the modern automobile, and a more correct distribution of metal.

Buys St. Louis Blast Furnace

The stack of the St. Louis Blast Furnace Co. was sold to the State National Bank, of St. Louis, for $75,000, Nov. 26. The bank was the only bidder. The sale is subject to the approval of the federal court. Terms are cash.

The Carnegie Steel Co. and the Bethlehem Steel Co. have taken orders for 1,000 tons of armor plate for a gunboat to be built for Sweden.

INCREASED CONSUMPTION

Of Lake Superior Ores in Eastern Territory Seems Assured.

In the judgment of leading eastern iron ore sellers, the greatest tonnage of Lake Superior ores in some years or even in history, bids fair to be consumed in the Lehigh, Lebanon, and Schuylkill valleys and other adjacent territories in 1913.

This broadening of Superior ore consumption in the eastern district, is expected to result from two conditions: First, from the increased operations of eastern furnaces, which promise to begin the new year more fully engaged than for several years, and second, from the partial withdrawal from eastern Pennsylvania of trans-Atlantic foreign ores, which will be diverted to European consumption. At the new schedule of prices, Lake Superior non-Bessemer ore represents a unit of iron cost of 9.42 cents in eastern Pennsylvania. There is no trans-Atlantic ore that is offered at the present time which is strictly competitive with this price. On offers of 8½ cents per unit, tidewater, equivalent to about 9½ cents, eastern Pennsylvania, some tonnage of Spanish ore, a 49 per cent material, could probably be obtained. The tonnage of Spanish ore, however, even at this advanced price, would be limited.

It is roughly estimated that under prosperous conditions and practically full furnace operations, about 1,000,000 tons of lake ore per year is needed nominally to complete the mixtures of the furnaces in the Lehigh, Schuylkill and Lebanon valleys and in the Harrisburg district. Ore sellers who have made a careful survey of the present situation, believe that if present conditions are maintained both here and abroad through next year, this million-ton consumption will be exceeded by several hundred thousand tons. Not all the lake ore consumed in the east is merchant ore, since several of the steel companies have interests in certain mines. Only two or three companies in all, however, are numbered in this class.

Representatives of lake ore houses who have been canvassing the eastern district for the past 10 days or two weeks, have made liberal sales on the new contract basis against the requirements of eastern consumers.

John J. Keefe, southern representative of the Independent Pneumatic Tool Co., at Atlanta, Ga., died Nov. 20, in Chicago, from an attack of typhoid fever. Interment was made at Bloomington, Ill., Sunday, Nov. 24. The deceased was born in Susquehanna, Pa., 46 years ago, and his entire business life was associated with the railroads, he having served for a number of years in the mechanical department of various roads until about 10 years ago, when he entered the railway supply field, and continued in that line.

LARGEST PAY ROLL

In the History of the Baldwin Locomotive Works.

For the last week at the Baldwin Locomotive Works the payroll was the largest in the whole history of the establishment. In the Philadelphia plant, there are now employed 12,000 men, and at the Eddystone plant nearly 6,600, while at the Nurnham works there are 2,650 men, making a total of 21,229 men employed by the firm.

The three plants are working right up to maximum capacity and doing a business amounting to $40,000,000 a year. Since August, the Baldwin plant has been running close to that basis. The Eddystone plant is completed and in operation. The present buildings, which will be added to as business requires, occupy about eight acres. The plant represents an expenditure of $8,000,000. It makes the castings and forgings for both works. All the erecting of locomotives for the home market is done here, while small locomotives and the foreign orders are erected in the Philadelphia works.

Heavy Sale of Coke

Pittsburgh, Nov. 27. (By wire.) — One of the coke producers with offices in this city late yesterday sold a good share of its entire output for the next year. About 120,000 tons of standard furnace coke are involved. This fuel will go to one of the local brokers, and it is understood that $3.25, ovens, was paid for the bulk of the tonnage. Many in the trade believe that there is no more $3 contract coke in the market and most conservative producers predict that prices on all grades will advance sharply after Dec. 1.

Bacon Elected. — Robert Bacon, former assistant secretary of state, more recently ambassador to France, and at one time partner of J. Pierpont Morgan, has been elected a director of the United States Steel Corporation to succeed the late Clement A. Griscom.

NO TARIFF DANGER

Says Andrew Carnegie on His 77th Birthday.

Andrew Carnegie quietly celebrated his 77th birthday at his home in New York City, Monday, Nov. 25. During the day he was the recipient of hundreds of letters and messages of congratulation and spent several enjoyable hours in perusing the tokens of goodwill from his friends. In the evening, he was the host at a small dinner given to his family and intimate friends. The noted iron master is enjoying splendid health and manifests his accustomed ruggedness of strength and constitution.

During the day Mr. Carnegie was prevailed upon to discuss politics and business affairs. He gave some of his characteristic opinions on the tariff and the steel business in the following words:

"I am a Republican, dyed in the wool, and I hope always to vote the Republican ticket, but a Democratic president is all right. As to those fears that some people talk about, I just smile at them. I believe in the reduction of the tariff, but I believe in President Taft's method—reduction on one article at a time. Don't worry about the tariff. It will go downward all right, but it will be difficult to make any grave reductions. The moment they try that, there will be some log-rolling among the states. Log-rolling is just plain faking.

"When I started in business this country did not make a pound of steel. Now this country makes more than all the other countries put together. Don't forget to put that down. Believe me, I wouldn't have gone into the business if I hadn't been promised a 30 per cent duty. Too many had failed before me to run any such risks. We needed protection to start the steel business. Now it is started, and I have favored reduction for years. Protection is only meant for infant industries, and it was never intended to keep up protection forever. Under no condition should the food of the people be taxed. But as for luxuries they should be heavily taxed."

National Tube Co. Plans Changes

Pittsburgh, Nov. 27. (By wire.)—The National Tube Co. today notified the trade of its intention to change pipe weights and list generally on Jan. 1, 1913. This action was taken to improve quality but not to raise prices.

Electric Furnace Methods of Steel Production---III

The Girod Type, Its Construction and Manipulation, With Details of the Cost of Refining Steel in Large and Small Installations

By John B C Kershaw

The total number of electric steel refining furnaces of the Girod type in use on May 1, 1912, according to figures supplied by the inventor, was 16, with an aggregate capacity per charge of 66 tons, while five additional furnaces having an aggregate charge capacity of 20 tons, were under construction. Since most of these furnaces operate with cold scrap, etc., and are producing steel for fine castings, guns and projectiles, making only three heats per 24 hours, the total daily output of the 15 furnaces now in operation, is only 225 tons.

The largest furnaces yet constructed or operated, are of 12 tons capacity. The fact that of the five furnaces now under construction, only one is of 8 tons capacity, and the others are 2, 3 and 4 tons, seems to indicate that the Girod type of furnace yields its highest efficiency and best results in the smaller units.

The most notable installations of the Girod furnace are to be found at the Forges et Acieries Electriques Paul Girod at Ugine, France, where six furnaces have been installed, and at the Krupp works, Essen, Germany, where one 12-ton furnace is in use. The 12-ton furnaces are charged with cold scrap and are operated chiefly to produce the special steels required for guns and projectiles. Only at the Gutehoffnungshutte, Oberhausen, Germany; at the Oberschlesische Eisen-Industrie, Gleiwitz, Germany, and at the Usines Pontiloff, St. Petersburg, is molten metal employed for the Girod furnaces installed, and the time required for the refining operation is reduced over that required when cold material is charged.

Construction of the Furnace

The hearth of Girod's furnace is circular or oblong, in which the metal, when molten, reaches a height of from 25 to 30 cm. One or more electrodes of similar polarity are suspended above the bath and soft steel pole pieces embedded in the hearth of the furnace in direct contact with the molten metal, form the negative electrode. The electric current, entering through the upper electrode, forms an arc between itself and the bath, traverses the bath and passes out through the lower pole pieces. The upper parts of these pole pieces become molten, but their length is not decreased by more than 5 or 10 cm. With a view to reducing the length of the fused parts and also to preserve the lower lining of the furnace, the extreme ends of the pole pieces are water-cooled.

The design of the refining furnace has not been altered materially since the first patent was issued to Girod in 1900 for a tilting crucible furnace, electrically-heated. Figs. 3 and 4 respectively show a plan and sectional elevation of the early furnace, and Figs. 6, 7 and 9 are sectional views of the improved furnace. The changes that have been introduced involve principally the arrangement and grouping of the negative electrodes in the base of the furnace and the grouping of the conductors and cables in order to minimize induction losses when operating the furnace with three-phase current.

The earliest type Girod furnace, Figs. 3 and 4, consisted of a shallow,

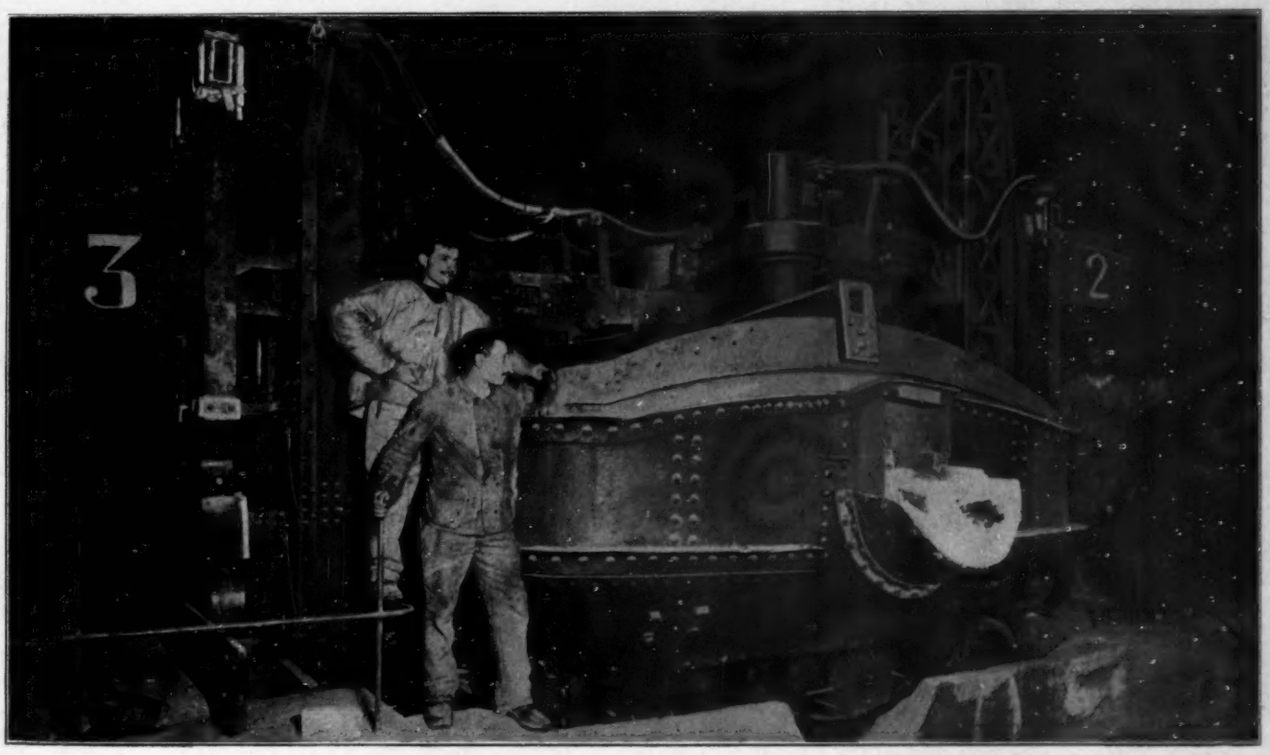


FIG. 1—THE 12-TON GIROD REFINING FURNACE INSTALLED AT UGINE, FRANCE

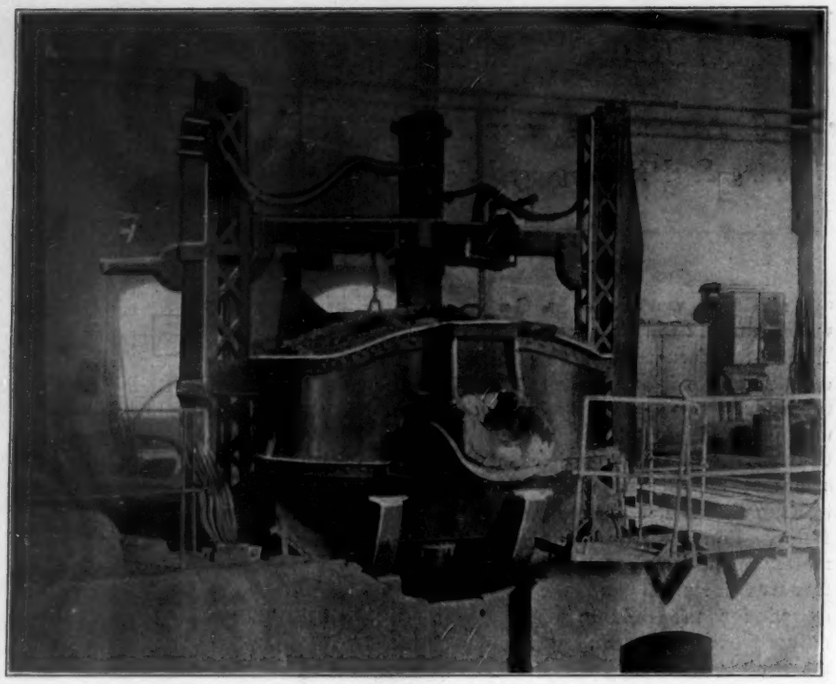


FIG. 2—A TWO-TON GIROD ELECTRIC REFINING FURNACE INSTALLED AT UGINE, FRANCE

cylindrical iron tank, mounted on trunnions, and lined with magnesite brick. The removable cover was made of silica brick and contained openings for the carbon electrodes. The bottom of the furnace was formed of a number of cast iron sections, embedded in the brickwork, which served as the negative electrode. In a furnace 2 meters in diameter, 14 of these plates were used, each of which was in contact with the contents of the crucible by molten iron charged into canals in the furnace bottom before the refining operation was commenced. Alternating current was employed. The upper electrodes were suspended in the slag, and the decarbonization of the charge was carried as far as possible. The steel was then recarbonized, by adding a calculated weight of high carbon metal. A furnace of this type utilizing 250 kilowatts produced one ton of steel from 1½-ton charges, in 4½ hours.

Sectional views of a modern, Girod refining furnace are illustrated in Figs. 6, 7 and 9, while Figs. 1 and 2 show a furnace installed at Ugine, France. The hearth of the furnace is formed by a rectangular, steel shell, lined with crushed dolomite, in place of the more expensive magnesite, used in the earliest types of furnaces. The furnace is provided with three charging openings which are closed by sliding doors, and with a tapping hole on the opposite side, through which the molten metal is discharged. The arched roof consists of a steel frame lined with silica brick, and contains openings for four carbon electrodes, suspended vertically, with their lower ends near to, but not touching the slag layer.

Negative Electrodes

In the refractory bottom lining of the furnace, six or more steel electrodes are embedded, and are in direct connection with the furnace shell and with the low tension side of the power plant. These bottom electrodes are placed as far as possible from the upper ones, the current passing through the entire charge, thereby uniformly heating the entire bath. The current in crossing the bath, produces an electro-magnetic field, which imparts a rotary movement to the metal, thereby hastening the chemical reactions. As the steel electrodes are water-cooled, their period of usefulness is greatly prolonged. The steel frame of the furnace is mounted on bearings, so that the chamber can be tilted for tapping and for the removal of the slag. The tilting movement is effected either by electric motor or hydraulic plunger. The electrodes are cylindrical and are of different sizes.

Single phase, alternating current is specially adapted for furnaces of small capacity, employing only one carbon electrode. Its use, however, entails the necessity of installing rotary transformers, effecting losses of about 14 per cent. Three-phase current, on the other hand, is specially adapted for large furnaces, and it can be employed wherever it is possible to connect the furnace directly to the alternator.

The use of three-phase current also obviates the losses arising from the use of rotary transformers, step-down transformers only being required. A special star connection is used when operating the Girod furnace on the three-phase system, the principle of the connection being that one of the phases is reversed, in relation to the other two. When the intensity of the current is equal in the three upper electrodes, the equilibrium of the three phases is perfect, and the current in its passage through the molten metal in the furnace, heats the whole charge equally. The following claims are made for the Girod furnace, when operated with three-phase current: Economy in power consumption, high thermal efficiency and quiet melting of cold charges.

Cable Arrangements

The losses involved by different cable arrangements for conveying the current to the furnace, have been carefully investigated at the Gutehoffnugshutte. The plan finally adopted to reduce the induction losses to a minimum, was to arrange the cables systematically around the furnace, as shown at *C*, Fig. 8, *A* and *B* being the earlier arrangements of cables, which were found unsatisfactory in practice. The advantages claimed for the arrangement, shown at *B*, are as follows:

The electric arc circling about the periphery of the carbon electrode

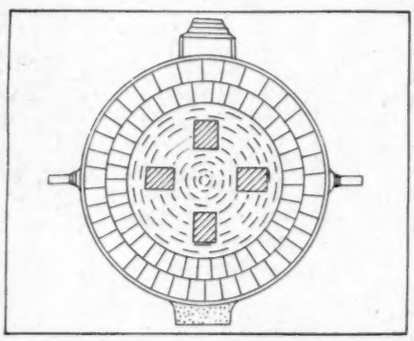


FIG. 3—PLAN VIEW OF THE ORIGINAL GIROD REFINING FURNACE

causes a strong agitation of slag and metal. This accelerates the speed of reaction between the slag and the iron bath and, therefore, reduces the time of refining considerably.

The arches of the roof, as well as the furnace walls, receive a more uniform radiation from the electric arc, and last longer.

The saving in energy consumption is 10 per cent, compared with the former arrangement.

Copper bus bars can be used instead of cables.

The metal bath is heated more uni-

formly throughout, and the resulting product is more uniform in quality.

Current interruptions, due to the rupture of the arc, are avoided, eliminating the resulting heavy current demands on the motor-generator set.

The consumption of the carbon electrode is more uniform, whereas with the former arrangement, one side of the electrode was consumed more quickly than the other, resulting in greater expense for electrodes.

Water-Cooling of Upper Electrodes

In an article published in *Stahl und Eisen*, July and August, 1911, Dr. A. Mueller deals with the heat losses due to the water-cooling of the upper electrodes, and with the supposed dangers of hearth-electrode cooling. This is the one special feature of the Girod type of furnace, which is criticized and condemned by electrometallurgists and practical steelmakers, and it is interesting to find that Dr. Mueller, as the result of considerable practical experience, considers that these criticisms are unfounded. The following quotation from his article proves this:

"Hearth-electrode cooling is still little understood, and has even been called a great drawback to the efficient operation of the Girod furnace. Fig. 10 shows that only that portion of the soft steel bars which projects below the furnace body, is cooled by water, the bars being connected by a common pipe line. The difficulties of maintaining the lining of the Girod hearth, also are often exaggerated. The dolomite hearth of the Gutehoffnungshutte furnace, rammed by compressed air rammers, has lasted through more than 1,000 charges, and has never given any trouble, in spite of the different lengths of heats, and the very different composition of the charges."

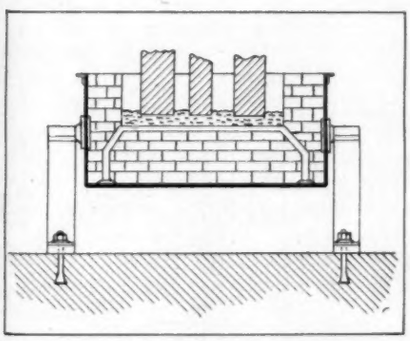


FIG 4 — SECTIONAL ELEVATION OF THE ORIGINAL GIROD REFINING FURNACE

Details are also contained in Dr. Mueller's article, of the calorimetric tests, made to determine the heat losses with the water flowing from the cooling pipes around the positive and negative electrodes of the 3-ton experimental furnace. The losses were as follows: Bottom electrodes, 1.01 per cent of the total energy supplied to the furnace, and top electrodes, 3.65 per cent of the total energy supplied.

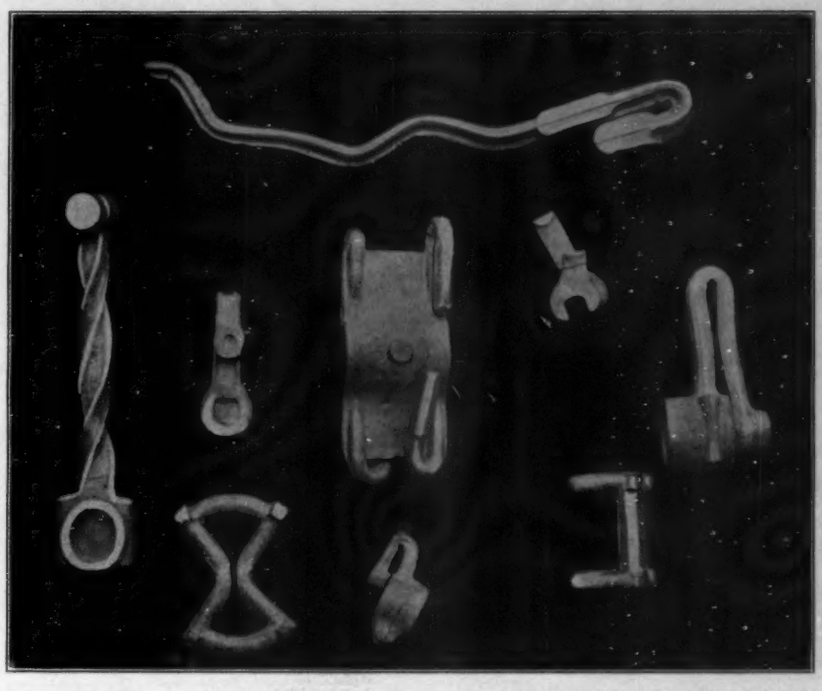


FIG. 5—SAMPLES OF ELECTRIC STEEL FORGINGS SUBJECTED TO SEVERE BENDING TESTS

The operation of this small experimental furnace has also thrown much light on the nature of many reactions in the refining of the steel. In the oxidation period, carbon is slowly removed, maganese more rapidly, phosphorus very rapidly and about 20 to 35 per cent of the sulphur. The sulphur appears to be removed in three ways: In the oxidation period by the action of the iron oxide in the slags; in the deoxidation period by solution in the high lime slags and by volatilization as silicon sulphide. It also has been noted that oxides, slag emulsions and gases, have a much more important bearing on the physical properties of the finished metal, than the sulphur and phosphorus present.

Operating the Furnace

The methods of operating the Girod electric refining furnace are similar to those pursued in working a basic open-hearth bath, the method of deoxidizing the charge alone being different from that followed in the open-hearth process of steel-making.

When the 3-ton furnace was charged with molten metal, it was found possible at the Gutehoffnungshutte, to tap five heats in 12 hours under favorable conditions, or eight heats, equal to 25 tons of steel, in 24 hours, when working continuously. The best method of charging the electric furnace with molten metal from the open-hearth furnace is to run the metal directly into the former by means of a long spout, the amount of metal charged being estimated. If a ladle is used and the metal is weighed, much loss of heat occurs.

The refining operation may be divided into two periods, namely, oxidation and deoxidation.

Oxidation Period

Oxidation is started by adding lime and iron to the charge. The proportion of these additions varies according to the chemical purity of the metal and is determined in such a way that after complete melting, the bath shows approximately the following composition: Carbon, manganese and silicon, less than 0.10 per cent. During this period of refining, oxidation is carried on vigorously, and the original low temperature of the bath favors a marked elimination of the phosphorus, practically all of which is removed before the slagging proceeds.

A forging test will show whether the metal is in the extra-soft state, and at this point, as soon as the temperature of the bath has become sufficiently high, the slag containing phosphorus and iron oxides is tapped off through the charging door, by slightly tilting the furnace backward. The first slag is immediately replaced by some lime, which has the effect

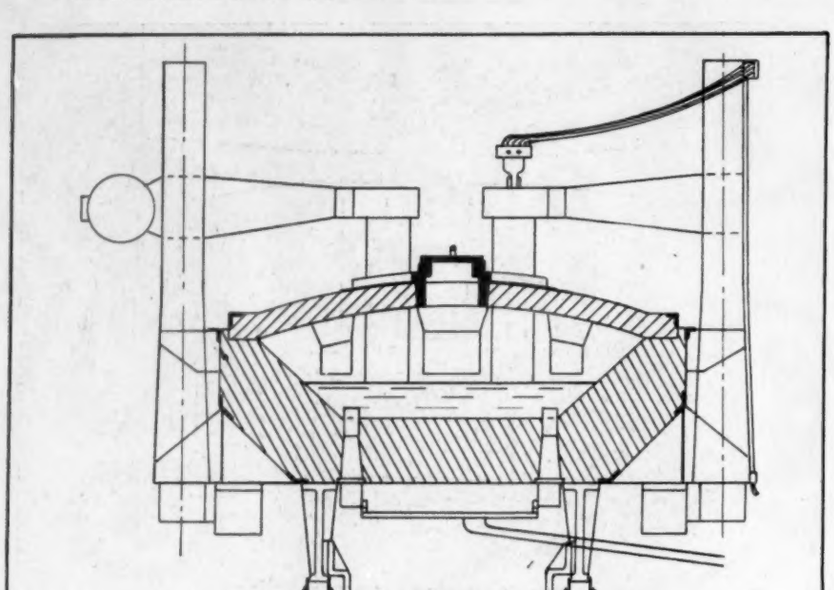


FIG. 6—SECTIONAL ELEVATION OF AN EIGHT-TON GIROD FURNACE

of cleaning the bath from the last traces of phosphoric slag. One slag is generally sufficient to remove all but traces of phosphorus.

Deoxidizing Period

After the oxidizing and cleaning slag has been removed, the first deoxidation of the bath is effected by adding deoxidizing agents such as ferro-silicon, ferro-manganese, etc., these alloys being added in such proportions as not to remain in the bath.

The bath is then rapidly covered with a slag consisting of about five-sevenths lime, one-seventh silica sand, and one-seventh of fluorspar, together with a slight addition of carbon, in the form of petroleum coke.

During this period of deoxidation, care must be taken that the furnace is properly closed, the temperature being held sufficiently high to reduce the iron oxide in the slag. The reduction of the ferrous oxide in the slag is indispensable for the deoxidation and desulphurization of the bath. Ferro-silicon, and petroleum coke are employed to insure complete deoxidation, and a slag is obtained which, in the air, disintegrates into a white powder.

In order to facilitate the complete deoxidation of the bath, it is advantageous to add small quantities of silico-manganese, silico-manganese-aluminum or even silicon-aluminum, these alloys acting very energetically upon the oxides in the bath, and forming a very fluid slag which easily rises to the surface.

During this same period, when the slag is completely deoxidized and is very basic, the desulphurization, which was incomplete during the first stage of the operation, increases and is rapidly completed at the time of tapping. Desulphurization starts vigorously when the highly basic lime slag becomes white and fluid, that is, after the removal of the metallic oxides. Carburizing materials are eventually added for finishing the metal and a final addition of ferro-silicon, ferro-manganese, etc., is made to arrive at the required composition of the steel.

The following data of the power consumption and operating costs of the Girod electric refining furnace, are taken from detailed information supplied recently to the author, by the Soc. A. Electrometallurgique Procedes Paul Girod, and are based upon the practical experience obtained at Ugine, France:

The power consumption recorded at the terminals of the furnace and including smelting, refining and finishing a charge of cold scrap, is about 850 kilowatt-hours for a 3-ton furnace, or 750-kilowatt-hours for a 10-ton furnace. These figures, of course, vary with the composition of the charge. According to the quality of the steel and its purity, the figures may be higher or lower than those quoted. The consumption of electrodes, per ton of steel made, is about 8 to 9 kilograms for the 3-ton furnace, and 8 to 10 kilograms for the 10-ton furnace.

One smelter, one assistant and one boy are required to operate the 3-ton furnace, whereas one smelter, two assistants and one boy, are required to operate the 10-ton furnace.

The Furnace Lining

The furnace can be lined with magnesite bricks, or it can be tamped with a tarred magnesite, or dolomite. Dolomite-tamped bottoms are now giving the best results. The work is

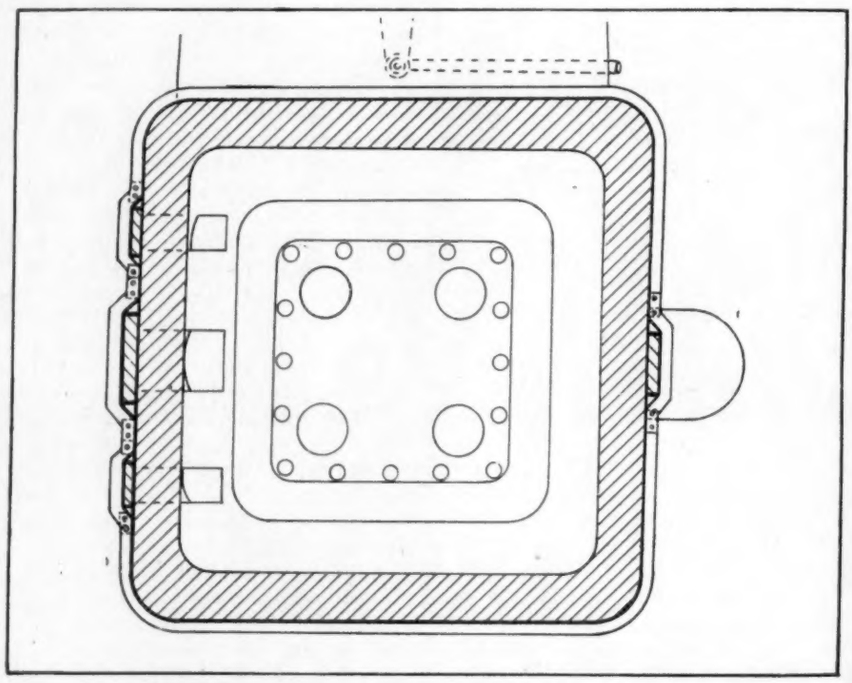


FIG 7—CROSS-SECTION OF AN EIGHT-TON GIROD REFINING FURNACE

done with heated hand tampers, or with pneumatic rammers. The durability of the lining is about 90 to 100 heats for the 10-ton furnace, and about 120 heats for the 3-ton furnace. At the end of that time, the side walls and the hearth will require repairs. All the burnt or oxidized parts of the walls are scraped. The bottom is broken down about 10 to 15 cm. and is retamped with a new layer of dolomite, taking care to leave a passage open for the tops of the negative electrodes. This repair of the upper part of the bottom is all that is necessary, as the damage to the walls at the slag line is repaired between the charging operations. The furnace roof is made of silica bricks, and lasts on an average for 50 heats for the 10-ton furnace, and 70 heats for the 3-ton furnace.

Cost of Materials

The cost of materials for slags, etc., varies considerably with the purity of the scrap used, and with the quality of the steel required. Lime, ore, silica sand, fluorspar and petroleum coke are all employed in the slagging process. The output of finished steel averages from about 90 to 96 per cent of the charged material, and depends chiefly upon the degree of oxidation of the latter before charging. When charging molten metal, the reduction of the refining period to 2½ hours, leads to a great reduction in the total cost of the process.

The cost of raw materials, deoxidizing additions, electric power, etc., of one ton of steel, refined in a 3-ton furnace at Ugine, France, is $21.55, whereas in a 10-ton furnace, with a proportionately larger output, the cost is reduced to $20.33. These estimates are based on the use of cold charges. When molten metal is charged, the cost per ton of steel made in a three-ton furnace is $17.58, and in a 10-ton furnace $18.81. These figures, however, do not include such costs as ingot molds, superintendence, depreciation, etc.

The scrap material charged analyzes as follows: Carbon, 0.35 per cent; silicon, 0.20 per cent; manganese, 0.70 per cent; sulphur, 0.095 per cent, and phosphorus, 0.095 per cent.

The analysis of the finished steel made from the above scrap is as follows: Carbon, 0.04 per cent and as high as 1.50 per cent, according to the carbon content desired; silicon, 0.20 per cent; manganese, 0.30 per cent; sulphur, 0.015 per cent, and phosphorus, 0.015 per cent. The analyses of various grades of steel refined in Girod electric furnaces are given in the accompanying table.

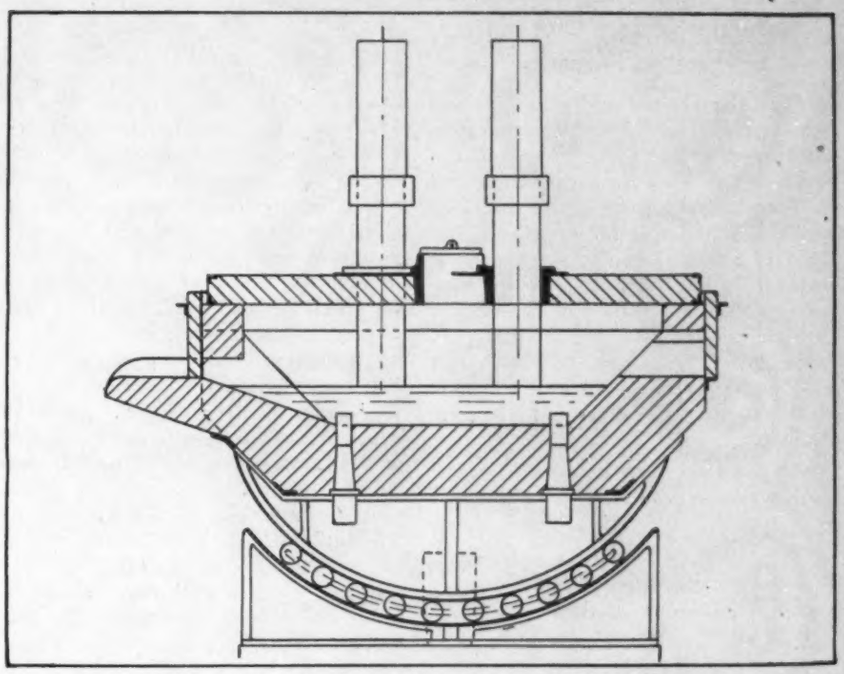


FIG. 9—SECTIONAL VIEW OF A MODERN EIGHT-TON GIROD REFINING FURNACE

The Girod Plant in France

The electric furnace at Ugine, France, is operated by the Soc. des Forges et Acieries Electriques Paul Girod, organized in 1909 to take over the electric furnace patents of Paul Girod. The original capitalization was 4,000,000 francs, which since has been increased to 12,000,000 francs. The total energy available at this plant fluctuates between 13,000 and 36,000 horsepower. A total of seven furnaces is operated, having an output of ½ to 12 tons capacity each per charge. The plant is arranged for the ultimate installation of 16 furnaces, with a daily output of 200 tons. Special alloys and high grade steels are refined in the smaller furnaces, while high carbon and nickel steels are made in the large furnaces.

Oehler & Co., Aarau, Switzerland, have replaced their crucible steel plant by a two-ton Girod furnace. The furnace charges consist of approximately 1½ tons of material and it is reported that the casting losses do not exceed 2 per cent.

The Simonds Mfg. Co., Fitchburg, Mass., has installed a three-ton Girod furnace in the crucible steel castings department of its Chicago plant. The steel is utilized in the manufacture of saws, machine knives, etc.

The Girod furnace in sizes varying from two to four tons is especially adapted to refining high class steel for the production of fine castings and for the manufacture of special alloys. In the Girod furnaces of large capacity, some difficulty has been experienced in maintaining the bottom lining, owing to the necessity of providing openings for the negative electrode terminals. In its special field, however, this type of electric furnace will undoubtedly be employed extensively.

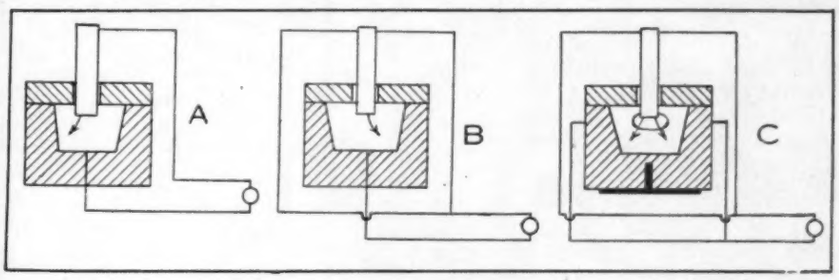


FIG. 8—VARIOUS ARRANGEMENTS OF ELECTRICAL CONNECTIONS TO THE GIROD FURNACE

It is said that if all the coke made in the United States were produced in retort ovens, these would yield approximately 1,000,000 horsepower from the carbon now wastefully consumed, disregarding by-products.

Reduction of Iron Ores in the Electric Furnace

That the electric reduction furnace was not evolved with the expectation of competing with the blast furnace, but for the purpose of developing a furnace and a process which could be utilized in those localities where blast furnace practice, due to the high cost of fuel, is not feasible, was the summary of the application of the electric furnace for the reduction of iron ores, made by D. A. Lyon, of Pittsburgh, in a paper presented before the Eighth International Congress of Applied Chemistry.

A list of the furnaces now in operation was given, as follows:

	Horsepower.
Trollhattan, Sweden, 1 furnace.....	2,500
Domnarfvet, Sweden, 1 furnace.....	3,500
Hagfors, Sweden, 2 furnaces, at 3,000 horsepower	6,000
Hardanger, Norway, 1 furnace.....	3,500
Heroult, Shasta co., Cal., 1 furnace..	2,000

While the following are nearing completion:

Hardanger, Norway, 1 furnace (extension)	3,500
Arendal, Norway, 3 furnaces, at 3,000-horsepower	9,000
Switzerland, 1 furnace	2,500
Total furnaces built and building...	32,500

The Noble Electric Steel Co., at Heroult, Shasta county, Cal., is also installing additional furnaces of sufficient capacity to give an output of 100 tons of pig iron a day.

The difference between the electric furnace and the blast furnace in operation is that in the electric furnace the electric current is used to replace that portion of the fuel in the blast furnace which is necessary for melting down the iron and the slag, and such being the case only one-third or less of the coke that is used in blast furnace work is needed for the reduction of the iron oxides.

The main difficulties encountered in the development of the electric reduction furnace are maintenance of crucible walls and roof, and breakage of electrodes.

The problems yet to be solved are those which have to do with the volume of the shaft as compared with the size of the crucible; the reduction in the shaft; gas circulation; the preheating of the ore; the smelting of fine ores; the size of the unit; the efficiency of the furnace, etc.

As to the comparative costs; for example, with coke at $6 a ton and with electric power at $16 per kilowatt-year, the reducing and melting costs of pig iron produced would be $6 in the blast furnace and $6.52 in the electric furnace, but if the initial cost of the blast furnace plant is taken into consideration, the efficiency of the electric furnace, etc., pig iron can probably be produced as cheaply in the electric furnace as in the blast furnace with coke costing $6 a ton and electric energy costing $16 a kilowatt-year.

The commercial operation of an electric reduction furnace depends upon the development of cheap electric power, and although power can now be developed very cheaply by means of gas engines, etc., yet according to Kenesche it does not seem possible at the present time to develop it by means of gas engines at a low enough cost to permit of its use for iron-reduction furnace work. The lowest cost estimated by Kenesche is $22.50, and this takes into consideration the use of a by-product plant, the sale of the by-products, and the utilization of the waste gases from the electric furnace.

At the International Engineering and Machinery Exhibition held at Olympia, Eng., in October, about 300 manufacturers were represented. Approximately 3,000 tons of machinery were shown, and occupied 50,000 square feet of floor space. The feature of this year's show was the large amount of machinery in motion, this class of exhibits taking up the larger portion of the center of the building.

COMPOSITION OF THE VARIOUS GRADES OF STEEL PRODUCED IN THE GIROD FURNACE

No.	Properties.	Carbon, per cent.	Silicon, per cent.	Manganese, per cent.	Sulphur, per cent.	Phos'rus, per cent.
1	Very soft	0.079	0.106	0.205	0.015	0.012
2	Soft	0.236	0.180	0.431	0.012	0.010
3	Medium soft	0.283	0.208	0.430	0.014	0.010
4	Medium hard	0.388	0.155	0.342	0.011	0.009
5	Medium hard	0.463	0.204	0.463	0.010	0.016
6	Hard	0.596	0.198	0.302	0.017	0.005
7	2 per cent nickel	0.076	0.099	0.101	0.014	0.013
8	3 per cent nickel (soft)	0.06	0.123	0.209	0.013	0.070
9	3 per cent nickel (hard)	0.364	0.144	0.435	0.012	0.015
10	5 per cent nickel (soft)	0.134	0.148	0.375	0.016	0.013
11	5 per cent nickel (middle soft)..	0.250	0.157	0.414	0.010	0.015
12	Nickel chrome	0.420	0.199	0.500	0.010	0.009
13	Tool steel	1.223	0.168	0.224	0.011	0.010
14	Tool steel	1.474	0.199	0.264	0.015	0.007
15	Tool steel	1.010	0.219	0.306	0.008	0.009
16	Tool steel	1.277	0.230	0.130	0.009	0.006

Fluorspar Production in 1911

Last year the total quantity of domestic fluorspar reported to the United States geological survey as marketed in the United States was 87,048 short tons, valued at $611,447, compared with 69,427 short tons, valued at $430,196, in 1910, an increase in quantity of 17,621 short tons and in value of $181,251. The production in 1911 was the largest ever recorded, 69,825 short tons of domestic gravel spar, valued at $420,932, being marketed against 52,013 short tons, valued at $282,561, in 1910. The highly satisfactory condition of the fluorspar industry in 1911 was due largely to the ability of American producers to meet the demand.

Fluorspar is found in crystals, generally cubical, in color ranging from a clear, slightly bluish or green glass-like tint through various other brilliant colors to dark purple, although much of it is white and opaque. Associated with other minerals, fluorspar has a broad distribution, but deposits of workable size are not abundant, those in the United States being in Arizona, New Mexico, Colorado, Illinois, Kentucky, Tennessee and New Hampshire.

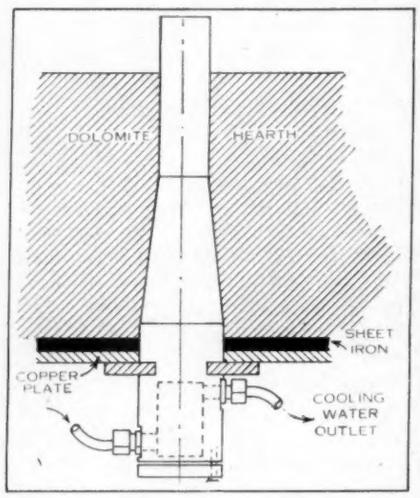


FIG. 10—SECTIONAL VIEW OF WATER-COOLED STEEL ELECTRODE

Fluorspar is used in the manufacture of glass and of enameled and sanitary ware, the electrolytic refining of antimony and lead, the production of aluminum, the manufacture of hydrofluoric acid and in the iron and steel industries, where it is used as a flux in blast furnaces and in basic open-hearth steel furnaces. It is estimated that about 80 per cent of the American fluorspar output, mainly in the form of gravel spar, is consumed in the manufacture of basic open-hearth steel.

Developments in the Preparation of Iron Ores[1]

A Discussion of the Various Processes Employed to Increase the Iron Content of the Blast Furnace Burden and the Utilization of Fine Ores and Flue Dust

By J W H Hamilton

The rapid growth of the mining industry during the latter part of the 19th century was accompanied by a great development of metallurgical processes for the utilization of ores that, on account of their low grade or refractory nature, had been considered of little or no value. Although a great many students of ore conditions have long recognized the fact that the beneficiation of low grade iron ores was becoming one of our most important problems, the general opinion has been that iron ores of sufficiently high grade to use in their crude state in the blast furnace were so abundant that there would be no necessity of utilizing the lean ones. Until recently, the opinion has also been prevalent that, with few exceptions, the low grade ores could not be dressed and transformed into a product suitable for the blast furnace at a cost low enough to make it possible to sell this product at a fair profit in competition with natural ores. The work of geological institutions and the statistics on the consumption of iron ores have rapidly changed the general opinion and have attracted attention to the low grade ores.

Iron Ore Production

In 1870 the iron ore produced in the United States was 3,831,891 tons. Since that time the production has been doubled about every 10 years, and in 1910 it reached the impressive figure of 56,889,784 tons. If the same rate of increase is kept up during the present decade, we shall be mining over 100,000,000 tons in 1920. In other words we shall then be mining at the rate of over 1,000,000,000 tons in 10 years. In Europe the increase in production during the same period was not so rapid as in the United States, but iron mining has there also attained such proportions that a marked depletion has taken place in a great many of the iron mines. It was less than two decades ago that the old Bilboa mines in Spain, which for half a century have been among the chief shippers to English, French and German furnaces, were considered almost inexhaustible. Today these mines show evidence of rapid decline. It is, therefore, gratifying to note that great interest is being manifested in the conservation of natural resources. An expression of this interest was the request that was sent out to all civilized nations to take stock of their iron ore resources and submit their figures to the eleventh International Geological Congress, held in Stockholm in 1910. The records of this congress show that the known and recorded high grade iron ore deposits containing 60 per cent or more metallic iron are very limited, the actual reserves being estimated at 1,300,000,000 tons and the potential at 687,000,000 tons. Out of these 1,095,000,000 tons actual and 123,000,000 tons potential ores are recorded for the Swedish mines.

Very large ore reserves averaging from 50 to 60 per cent metallic iron exist in various parts of the world, but the great mass of iron ores contain on an average much below 50 per cent iron. In the records from the Lake Superior ore shipments one can observe a steady decline from year to year in the average iron content of the ores. It is, therefore, evident that we are rapidly approaching the era when the beneficiation of iron ores will be the rule, and not the exception.

Most mines are now equipped with crushers, which break the ore to about 4 inches before it is shipped to the furnaces. In Europe the buyers' specifications generally call for ore crushed to 6 or 8 inches. Since the steam shovel was introduced for loading ore mined in open cuts, the crushers have been gradually increased in size until they now are built so large that they can break rock of any size that can be handled by the shovel. The crushers used in connection with iron ore mining, and particularly in connection with steam shovel mining are of the jaw and gyratory type and the Edison giant rolls.

The jaw crusher can be built with a receiving opening that can take a larger rock than a gyratory of the same weight. A gyratory crusher can be built to give a larger output of a certain size than a jaw crusher of the same weight. In the case of the largest crushers the capacity does not make much difference, because it is generally so great that it is not practical to get the ore to the crusher fast enough to load it to its full capacity. It is claimed that the gyratory consumes less power per ton of crushed ore than the jaw crusher. This may be true of slabby material, which is easily broken in the gyratory. A slab will rest both its ends on the concaves and the cone will hit it in the middle and break it with the exertion of very little power. A gyratory is, therefore, often termed a breaker instead of a crusher. There are few test records of any value for the comparison of the actual power consumption of the two types. The most noteworthy gyratory installation is at Nashwauk on the Mesabi range. This machine is the largest of its type and has an opening of 48 inches between cone and concaves. The largest jaw crusher that ever has been built for iron ores was recently shipped from this country to the Kiruna mines in Sweden, where it will be employed for crushing ore for export, partly for the United States. The jaw opening of this crusher is 60 x 84 inches and the weight of the machine is about 400,000 pounds.

Giant Rolls

The Edison giant rolls are used at the Benson mines in New York and at the Cornwall mines in Pennsylvania. At the latter place the ore is first crushed to about 14 inches in a 42 x 60-inch jaw crusher, from which it goes to the Edison rolls. These break the ore by impact and not by crushing as do the ordinary crushing rolls. The surface of the Edison rolls has a number of projections known as sluggers, which, on account of the very high speed of the rolls and their great momentum give terrific blows to the ore pieces dumped on top of them and smash them to pieces. They are particularly effective on comparatively soft ore of the Cornwall type. This ore goes largely into fines during the mining and

[1]Presented at the Pittsburgh meeting of the American Iron and Steel Institute.

when these fines get wet they become sticky and are likely to choke ordinary crushers. On account of their high speed, the Edison rolls throw off any ore that has a tendency to adhere to the roll shells.

The large ore crushers have been found to reduce the cost of mining considerably. Block-holing and sand-blasting have been reduced to a minimum. It is much cheaper to break rock by mechanical power than by dynamite.

Concentration

Although the washing of soft hematites and brown ores is the ancient method of concentration, the greatest progress has been made in the treatment of magnetites, which on account of their magnetic properties are peculiarly well suited for concentration. The magnetites are concentrated either wet or dry. The advantage of one system over the other depends largly on the nature of the ore. As a general rule, it can be said that the coarse crystalline ores can be treated to the best advantage by the dry method, whereas with the fine-grained ores, better results are obtained by the wet system.

Coarse Crystalline Magnetites

The coarse-grained ores are generally easy to concentrate, and the concentration can be done at a very low cost. The most expensive part of the operation is the crushing; and the coarser the grain, the less the cost. In many ores, it is necessary only to eliminate pure rock which happens to get mixed with the ore in mining. In such cases, a cobbing of the ore after it has been crushed to about 2 inches is all that is necessary. Coarse-grained magnetites are abundant in the Adirondacks in New York state, also in New Jersey and several other states. The large ore dposits of northern Sweden and those of the Grangesberg mines are principally of this type. The most interesting separating plants working on coarse crystalline magnetites are those of Witherbee, Sherman & Co., Mineville, N. Y. Experiments with magnetic separation were begun here as early as 1852, but it was not until the 80's that the magnetic separation became a commercial possibility. Since that time its development has been rapid. New mills have been built from time to time and today the company has the largest magnetic separating equipment in the world. The aggregate capacity of the four mills, when operating only one shift, exceeds 1,000,000 tons per year. As the milling system here represents the most up-to-date practice in dry magnetic concentration, we will discuss the various problems principally as they occur in connection with this plant.

Cobbing

The cobbing of the coarse material was formerly done by hand, but mechanical cobbing is now becoming more common. At Witherbee, Sherman & Co.'s mines, magnetic-cobbing has completely replaced hand-cobbing, with the results that the cost of operation has been very much reduced, four men now doing the work that formerly took 14; that the cobbed product is absolutely uniform, and that there is no unnecessary loss of iron in the tailing. Within certain limits, the iron content in the cobbed ore can be varied by regulating the magnetic field.

The ore is crushed to 4 inches as it comes out of the shaft and is then delivered by belt conveyor to a revolving screen with 2-inch perforations. The over-size is re-crushed and returned to the screen and the through-size goes over the cobber. If it is desirable to take out low grade ore as well as high grade, the magnets are given their maximum current and the tailing is immediately discarded. If only a high grade ore is desired, the cobber is given a weak field so that it picks out only the rich ore and the tailing is passed to another cobber with a strong field. The ore recovered on this machine is sent to the concentrator for crushing and separation and the tailing is discarded.

Dry Crushing and Concentration

After the ore has been crushed by jaw crushers and gyratories to about 1½ inches, the fine crushing is generally done by rolls. For sizes ranging from about 2 inches to ¼ inch the smooth rolls have been found to be the most efficient crushers. The size of the rolls should be made to suit the size of the material. For effective roll crushing, the material should be carefully sized. Crushing rolls of as large size as 72 inches in diameter and 30 inch face are used now on low grade copper ores. These rolls have a very large capacity and can crush ore from 4 inches down. The size mostly used for iron ores are 42 inches in diameter and about 16-inch face. Rigid rolls have been tried, but generally with disastrous results. It is, however, good practice to make the springs so stiff that they will give very little unless a piece of iron or steel happens to get in between the rolls. Corrugated rolls have a very good *nip* and can crush coarser ore than the smooth rolls of the same diameter, but the corrugations wear off and then the nipping power diminishes so that the rolls can no longer do the same work. Also, because corrugated rolls can not be trued without removing the corrugations, they are not much in use.

New Mill at Mineville

The No. 4 mill at Mineville, which has recently been placed in operation, is the latest step in the evolution of dry magnetic separating plants. Its most noteworthy features are the flexibility in the milling operation, gained by making the coarse crushing entirely independent of the separation and fine crushing; the close sizing of the material before it is separated; the roll crushing of all fine sizes and the arrangement of the rolls so that any one of the eight sets of rolls can be cut out for repairs without interfering with the operation of the mill. Only the fines are dried, as it has not been found necessary to dry the coarse ore. A vertical stack dryer is used for the purpose. Between the crushing and the separating departments is a 1,000-ton storage bin, which acts as a reserve bin, and is, therefore, by-passed in case the crushing and separating departments are in operation simultaneously. The coarse sizes are screened on revolving screens and the fine sizes on vibrating screens. The coarse ore is cobbed on drum type and pulley type cobbers. Two machines are always used in series for a three-product separation. The concentrate from the first machine goes directly to the concentrate bins, the middling, which is the head product of the second machine, goes to the rolls for crushing and re-separation, and the tailing from the second machine goes to the dump. For the medium and finest size ores the Ball and Norton drum type separator is used. As it is not always necessary to make a three-product separation of the finest sizes, these separators are arranged so that they can be operated either in series for a three-product separation, or in parallel for a two-product separation.

The capacity of the mill is 100 tons per hour or 1,000 tons per day of 10 hours. As it requires only 14 men to operate the whole plant the labor cost per ton of ore milled is very low. The iron content of the concentrate ranges from 64 to 65 per cent and the phosphorus is about 0.03 per cent. The mill produces an excellent Bessemer ore which, in

common with other products of magnetic separation, has the advantage of great uniformity, no matter how much the raw material varies.

Fine-Grained Magnetites

When a fine-grained, low grade ore is crushed to a powder a large portion of it goes into dust. It is difficult to make a clean concentrate from such material on dry magnetic separators, and the handling of the dust becomes a serious problem in the mill. For this reason the wet crushing and separation has been found better adapted for ores of that nature. It has been stated previously that the fine crushing is the costliest part of the separating process and this is particularly true of the fine-grained ores. The comminution, therefore, should not be carried any further than is necessary to liberate the ore crystals from the adhering gangue. While some fine-grained ores can be separated satisfactorily after a crushing to 20 mesh, others must be crushed to 100 mesh or finer. Through a series of separation and screening tests the proper crushing size can be determined, but a more thorough knowledge is obtained by making a microscopic study of a thin section of the ore. The expert petrographer is able not only to measure the size of the ore crystals, but also to determine the various minerals that compose the gangue. Scientific methods are today being applied in engineering problems where a few years ago only rule-of-thumb methods were used.

The coarse crushing methods are the same as in the dry mills, but the fine crushing of iron ores to about 20 mesh is almost invariably done in the ball mill. If the comminution must be carried further, the pebble mill is used. The ball mill is generally fed with ore crushed to 2 or 1½ inches.

Large Wet Mill

The largest and most interesting wet mill working on low grade, fine-grained magnetite is the one at Sydvaranger in Norway, about 220 miles north of the Arctic circle. The ore is mined in open quarry and is loaded by steam shovel. The crude ore averages about 36 per cent iron and it takes about two tons of crude ore to make one ton of concentrate. In order to make a good separation it is necessary, on account of the fine grain of the ore, to crush it to about 100 mesh. The first crushing is done in two No. 18 gyratories, which have a 36-inch opening between cone and concaves. These are followed by jaw crushers, reducing the ore to 2 inches, which size is fed to the ball mills. The concentrate is dewatered in large concrete settling tanks and is taken from these tanks by overhead cranes and grab buckets to the briquetting presses. The yearly capacity of the plant is at present 500,000 tons of concentrate, one-half of which is briquetted. The rest is dried and shipped in the form of concentrate.

Large Canadian Plant

At Moose Mountain, Ont., another concentration plant has been built for treating an ore similar to the one at Sydvaranger. The capacity of the first installation is 350 tons of concentrate per day. Several new features have been introduced. The ore after having gone through the preliminary crushing to about 3 inches will be pulverized in impact crushers specially designed by the mining company. These reduce the ore to sufficient fineness for separation. The concentrate from these machines is reground in conical mills and is then retreated on the same kind of separators. A new briquetting machine, which will eliminate the manual labor of transferring the briquettes from the press to the car, is also being developed by the company. The briquetting kilns are gas-fired, and are of the Grondal type. The plant has the advantage over the Sydvaranger plant of cheap water power. The briquettes will contain about 64 to 65 per cent iron, 0.02 per cent phosphorus and 0.014 per cent sulphur.

Titaniferous Ores

Although ferro-titanium and titanium steel are used in large quantities, the titaniferous iron ores are not yet considered a commercial product. Various attempts have been made to improve the titaniferous ores by magnetic separation, but it has been found impossible to make a high grade concentrate without losing too much iron in the tailing. If the titanic acid does not exceed 3 per cent, the ore can be smelted in the blast furnace without any trouble, but if the titanic acid is higher, the slag gets sticky and difficult to handle, unless special precaution is taken in preparing the burden. Experiments have been made by Rossi, who has demonstrated that under certain conditions ores of higher titanic content can be successfully smelted; but no such ores are at present worked on a large scale. As there are large titaniferous ore deposits containing over 50 per cent of metallic iron, there is no reason why these ores should not be utilized by mixing them with other ores and thereby bringing the titanic acid in the mixture within such limits as are not objectionable for the blast furnace. A great many of these ores can be mined cheaply and can be cobbed at a small cost by magnetic machines. The iron content in the cobbed product would be sufficiently high to make the ore desirable for mixing with other ores free from titanium. If a company operating on a large scale systematically mixed a certain portion of titaniferous ores with all ores shipped, it would, in many cases, be in a position to utilize without any detriment to the furnace operation as large a proportion as 25 per cent of the titaniferous ores, now considered undesirable.

Concentration of Hard Ores

Some hard hematites are mixed with magnetites. Such ores generally are crushed and sized and first treated on magnetic separators. The tailing from these machines is concentrated on jigs. If the ore contains only hematite it is hydraulically-concentrated. The recovery on jigs is not so high as on the magnetic separators. In the former it is considered good work if the iron content in the tailing does not exceed 12 per cent; in the latter it is often brought below 5 per cent. Jigging plants for hematite have been erected recently at Bathurst, New Brunswick, and Annapolis, Nova Scotia, and several plants are in operation at the Swedish mines.

The sandy and clayey ores are treated principally by washing or a combination of washing and jigging. Log washing is an ancient art, and there has been little development in the process, apart from the introduction of shaking tables for treating the fines. The improvements that have been made lately pertain principally to mechanical features in the construction of the machinery and the mills. The washing plant of the Oliver Iron Mining Co. at Coleraine on the western Mesabi range is a notable example of modern mill construction. An interesting feature of this plant is that, although it has been built on level ground, the ore is never raised by either elevator or inclined belt conveyor. The ore trains are run over a high trestle into the top story of the plant and the ore is discharged from bottom-dump cars into receiving bins that are sufficiently high to allow the material to drop by gravity from one ma-

chine to the other all through the plant, until it is finally discharged into the shipping bins. The concentrate from the tables, which is delivered to the bins by means of Frenier spiral pumps, is the only ore that has to be raised to the bins by mechanical means. The plant is built in five units, and provision has been made for extension. Its capacity has never been definitely ascertained. Over 20,000 tons have been washed in a day without loading the machinery up to capacity. Aside from the men employed at the picking belts, very little labor is required. As the ore is not crushed and, therefore, contains pieces too large for jigging, the oversize, after thorough washing in the revolving screens, is fed to wide, slow moving belts where the rock is picked out by hand. What goes through the screens is washed in log washers built entirely of iron and steel. The fines are treated on Overstrom tables.

Washing Plant

The washing plant of the International Harvester Co., completed this year at Nashwauk, Mesabi range, is built on lines similar to the Coleraine plant, but it has no tables for the recovery of the fines. Other plants on a similar scale are in construction in the Lake Superior district.

In connection with these plants it might be well to mention that in mill construction in general the improvements that have been made during the last few years are extensive. The crushing machinery has been much improved and the cost of crushing has been reduced by about one-half. Elevators which used to give daily troubles to mill men, are built now so that they can run for years with little attention. Transmissions and milling machinery in general are built stronger and provision is made for heavy overloads.

Dry Concentration of Clayey Ores

Although wet processes have been almost universally employed for the concentration of hematites, dry methods have also been used. A treatment of that kind has been developed by E. F. Goltra, and a plant utilizing it has been built at Waucon, Wis. The principal features are the heating and trommeling of the ore in a cylinder similar to a rotary dryer, and the removal of the gangue and clayey dust by a strong air blast, created by a powerful suction fan connected to the charging end of the kiln. The air current and combustion gases and the material travel in opposite directions. It is too early to give any results from this process, but it has merits and will probably give satisfaction on certain kinds of ores.

A Beneficiation of Phosphorus Iron Ores

Many magnetite ores carry apatite in the gangue. Such is the case with the Old Bed ores at Mineville, also with many of the Swedish ores. At Mineville most of the phosphorus is eliminated by magnetic separation, and the tailing, which contains, besides the apatite, several more or less weakly magnetic minerals, is cleaned on strongly magnetic Wetherill separators. Part of the apatite concentrate, containing over 40 per cent bone phosphate, is sold to fertilizer works, but as only the high grade apatites are suitable for treatment by the acid method, the market for low grade product is limited. To utilize, also, the low grade material, Dr. W. Palmer has developed an electrolytic process by which it can be converted into a high grade fertilizer. A plant on a commercial scale is now in operation at Trollhattan, Sweden, and in this plant some of the phosphorus magnetites from the mines in Lapland have been successfully treated. It is possible to treat either the tailings from separating plants or the crude ore. At the Kiruna mines in northern Sweden, there are enormous deposits of magnetites containing about 56 per cent iron with a gangue composed almost exclusively of apatite. When this ore is treated by the Palmer process, the iron content is raised to 71 per cent and the phosphorus is lowered to 0.03 per cent.

Roasting and Agglomeration

In the United States hard ores are roasted only when they are high in sulphur, but the practice in Sweden is to roast nearly all lump ores. As charcoal is used there almost exclusively for making pig iron, it is necessary to economize this expensive fuel, and for that reason the ores are roasted not only to eliminate sulphur, but also to oxidize them and make them more porous. When some of the hard ores are crushed they produce so much fines that the roasting becomes difficult in ordinary furnaces. At the Oxford furnace in New Jersey, to avoid this trouble, the ores used are screened and the fines are roasted separately in Wedge rabble furnaces.

Few of the fine-grained soft ores are suitable for smelting in their crude form. Still, they are used in large quantities, and a comparatively small proportion is transformed into a suitable lump form. Increasing interest has recently been shown in the processes for treating these ores preliminary to smelting. The good results obtained at the furnaces that now are operating with the improved ore are so obvious that it will be an inducement for those who are troubled with fines to transform at least part of them into suitable lump form. The most common methods of treating the fines are nodulizing, briquetting and sintering.

Nodulizing

The nodulizing process was first used on a large scale for desulphurizing and agglomerating pyrites residues at the plant of the Eastern Nodulizing Co., Hackensack Meadows, N. J. It is now used on nearly every kind of ore. The product of nodulizing kilns is a good blast furnace material, but the nodules are more glazed and not so porous as the products from some of the other processes. The Pennsylvania Steel Co., at its Lebanon, Pa., plant, is nodulizing magnetic concentrates from the Cornwall ore. Several plants have been built for the nodulizing of flue dust, for instance that at Hubbard, O., and the plant of the Illinois Steel Co., South Chicago. A plant for treating siderites high in sulphur has been built at the Magpie mine, Michipicoten, Ont. Here the carbon dioxide as well as the sulphur is driven off. The largest nodulizing plants are those treating Cuban brown ores in the province of Oriente, Cuba. The Mayari and Moa ores contain as much as 14 per cent chemically-combined and 25 per cent hygroscopic water. By the nodulizing of the ores they are reduced nearly 40 per cent in weight. Some of these ores are now being treated in Greenawalt sintering plants, built by the Pennsylvania Steel Co., at Sparrows Point, Md., and Steelton, Pa.

Drying Iron Ore

To reduce freight charges some ores are dried in rotary kilns. Plants for this purpose have been built at the Hollister mine, Crystal Falls, Mich., and at the Brunt mine and Mountain Iron on the Mesabi range. The moisture content of the hard ores is negligible, but the soft ores can absorb as much as 25 per cent of water. After the ore has been dried some moisture may be reabsorbed during transportation, but the amount is small, considering that from the time the ore is shipped until

it reaches its destination the rainfall seldom exceeds a fraction of an inch.

The first successful briquetting system for iron ores was developed by Dr. Grondal, who worked principally with fine-grained magnetic concentrate. This material is particularly well adapted for briquetting. The principal features of properly made Grondal briquettes are that they have no artificial binder and can be subjected to heat without disintegration; they are not vitrified, but are very porous and easily penetrable by the reducing gases; they are strong and can be handled without going into fines; they are nearly free from sulphur even if the sulphur content in the crude ore is as high as 2 to 3 per cent; they are highly oxidized and the magnetite is transformed into hematite; they are easily reducible in the furnace and require comparatively little fuel.

Fine ores of nearly all kinds are now briquetted. Over 500,000 tons of briquettes are yearly produced from magnetic concentrate in Sweden and Norway. Large quantities of limonites are briquetted in Spain, and pyrites residues in England and the United States. During the past year a four-kiln plant has been in operation in Mayville, Wis., briquetting Mayville ore. The briquettes are used at the furnaces of the Northwestern Iron Co., where the advantages gained by briquetting fine ores have been well demonstrated. Only part of the ore is briquetted and about 30 per cent of the burden is made up of briquettes. The advantages gained are many. The amount of flue dust has been greatly reduced, resulting in a higher efficiency and a longer life of the stoves; the hanging and slipping have been eliminated, whereby good control of the furnace has been obtained, and a uniform product is produced; the life of the lining is much prolonged; the output of the furnaces has been increased without corresponding increase in labor and the grade of pig iron has been improved.

Sintering

The application of blast-roasting to the sintering of fines and flue dust is the latest development in the preparation of iron ores. The Huntington-Heberlein process, which is successfully used for roasting sulphides, has not been found so effective for sintering fines as the two down-draft processes, both of which are now employed on iron ores. The continuous system developed by Dwight-Lloyd for the treatment of copper sulphides and flue dust is now successfully working on iron ore flue dust. At the plant owned by the American Ore-Reclamation Co., Birdsboro, Pa., experiments have been made with various kinds of ores, all of which have been sintered successfully. In the flue dust there is often enough coke to sinter it without the addition of any other fuel, except that required for ignition. If there is an excess of coke it is best, in order to get the full benefit of it, to mix in some fine ore free from fuel. The sinter produced makes a good blast furnace material. It is porous and offers a large surface to the reducing gases.

Greenawalt Process

The Greenawalt sintering process has been referred to in connection with the Cuban ores that are sintered by the Pennsylvania Steel Co. at its Steelton and Sparrows Point plants. The Greenawalt system is intermittent. The ore is mixed with fuel, generally in the form of crushed coal or coal screenings, and is charged in large shallow pans in which the grate bars are placed from 10 to 12 inches from the top. The charge is made level with the top of the pan and an igniter carried on a track is placed over it. The pan is suspended on hollow trunnions connected to an exhaust fan, which is started as soon as the oil burner in the igniter is turned on. In less than a minute, the reaction has spread all over the surface. The igniter can then be removed. It takes from 15 minutes to one hour, depending on the nature of the material, to complete the sintering of a batch. When the reaction has reached the porous bed, which is a layer of inert sintered material spread on top of the grate bars for their protection, the suction fan is shut down and the pan is tilted to allow the sintered material to drop out on a grizzly or directly into the railway cars. The pan is then returned to a horizontal position and is ready for the next batch. The capacity of the pan depends much on the nature of the material. From some ores as much as 100 tons can be produced in 24 hours in a 7 x 12-foot pan. From other ores only 50 to 60 tons can be produced.

Some interesting features have been noted during experiments with this process. It has been found to be of importance to have the moisture content in the ore within certain limits in order to obtain good results. Some ores, for instance magnetic concentrate, require about 7 per cent of moisture, whereas others, as for instance pyrites cinder, sometimes require over 20 per cent. Some ores can be sintered in about 15 minutes and others require as much as an hour.

The desulphurization by this process is very good, provided that the fuel is not used in excess. If an ore is high in sulphur, little or no coal should be added, and the less coal is added the more complete is the desulphurization, provided that the ore contains enough fuel for the necessary combustion. Experiments have been made with a magnetite ore containing 1½ per cent of sulphur in the form of pyrrhotite. With the addition of only 2 per cent of coal, a good sinter containing 0.05 per cent sulphur was produced. Other ores in which the sulphur has been combined with calcium and barium, forming gypsum and barium sulphate, combinations which in ordinary roasting furnaces are very difficult to break up, were successfully desulphurized. To obtain good results it was found necessary to use barely enough fuel to agglomerate the charge without fusing it into vitrified masses that would be impenetrable to the gases. If an insufficient amount of fuel is used, the sinter becomes soft and, to a large extent, goes into fines. If an excess of fuel is used, the sinter becomes glazed and, in spite of its honeycombed nature, loses in porosity. It is not possible to avoid all vitrifying and still make the sinter strong enough for transportation and handling, but it can be reduced to a minimum if the fuel is correctly proportioned. A noteworthy feature found during these experiments is the remarkably low fuel consumption.

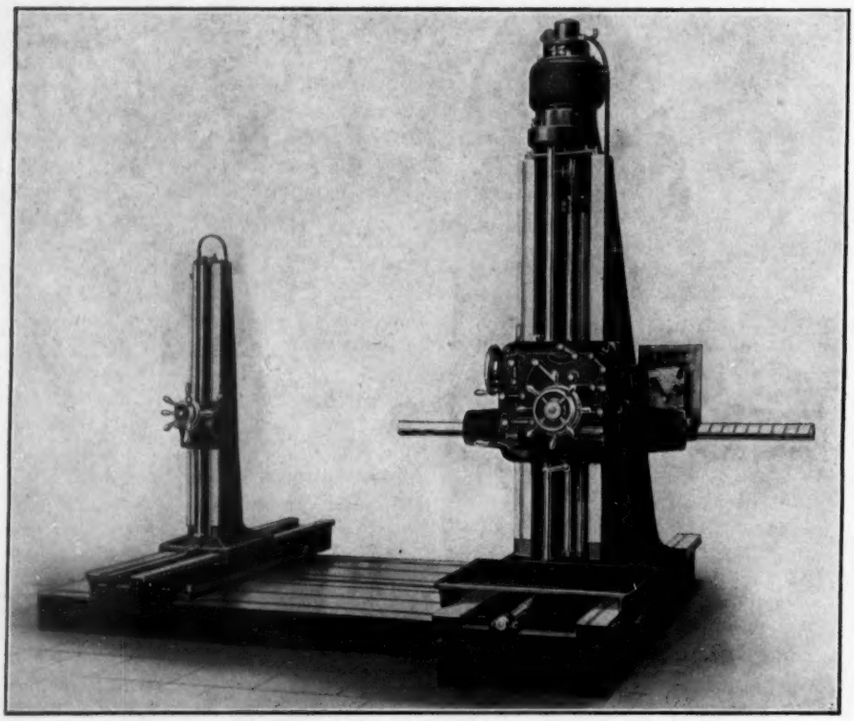
New Galvanizing Process

A new method of galvanizing iron is reported from Germany. The process, which has been patented, consists in so preparing the iron that the zinc enters its pores. After steeping in sulphuric acid, the iron is placed in a solution of mercury chloride and then heated, resulting in decomposition of the mercury chloride, which forms an amalgam with the iron on the surface. The iron is then plunged into a zinc bath heated to 500 degrees, where it remains three minutes. It is claimed the iron galvanized by this process shows an unusually strong adhesion to the coating of the metal. Microscopic investigation is said to have shown that the zinc penetrates into the pores of the iron and if a portion of the coating is worn or broken off, the iron does not rust, owing to the presence of sufficient zinc in the pores.

Combination Boring, Milling, Drilling and Tapping Machine

For the purpose of economizing floor space, the Rochester Boring Machine Co., Rochester, N. Y., is now building a floor type of machine, shown in the accompanying illustration, with which it is stated that it is possible to perform boring, milling, drilling, tapping, splining, oil-grooving and rotary-planing operations at one setting. In case a standard electric drive is used, the motor is mounted on the top of the column, where it is free from dirt and chips, and, through rawhide gearing, drives the vertical shaft, which transmits power to the driving mechanism enclosed in the saddle. This arrangement eliminates many gears and shafts, with a resulting high efficiency, and it is said that smaller motors can be used. All speed changes are mechanical, permitting the use of either direct or alternating current. The saddle is of the box type and is built as a complete unit. The levers and hand wheels for speed changes, feeds and traverses, are conveniently located for the operator. The lever for starting, stopping and reversing the machine is also placed on the saddle, and this lever is operated without stopping the main drive. Hand adjustments are provided for milling, also a rapid power traverse and automatic safety stops to prevent accidents.

The column, which is of heavy construction, is adjustable along the bed by hand or power. The spindle is made of hammered, crucible, high carbon steel, ground to size on dead centers. It is journaled in tapered, phosphor-bronze bearings, adjustable from the outside and furnished with felt wipers. The steel sleeve, to which the spindle is keyed, is journaled in independent bearings, and the clearance that is provided, is said to eliminate vibration from driving gears. Full traverse of the spindle can be obtained without resetting. A powerful concentric screw feed permits continuous feed for any length. Feeding is performed through a long, bronze nut engaging a square thread in the spindle, and a differential speed is obtained between the nut and the spindle. The bar is controlled by a hand wheel, through positive planetary gearing, whether at rest or running. This rotating and feeding of the spindle through its own bearing is said to eliminate scoring and cutting. Vertical milling feeds are provided for the saddle, and horizontal milling feeds for the column, independent of the boring feeds. Power rapid traverse, independent of the feeds, is furnished for the saddle, column and spindle. The size of the floor plate ranges from 4 x 7 to 8 x 12 feet.



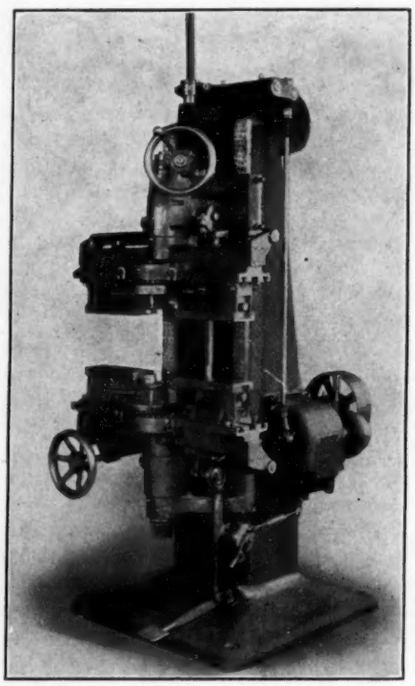
COMBINATION BORING, MILLING, DRILLING AND TAPPING MACHINE

The number of miners engaged in bituminous and lignite mining in 1911 was 549,750, and in anthracite mining 172,585.

Machine for Double-Seaming

A machine for double-seaming, in one operation, both ends of square, oblong or oval cans, built by the E. W. Bliss Co., Brooklyn, N. Y., is shown in the accompanying illustration. The machine has a capacity for cans up to 8 inches square and 15 inches high, but the speed of operation depends, to some extent, on the shape of the work. Oblong cans, 3 x 8 inches, may be produced at the rate of 12 per minute, but square or oval shapes can be double-seamed at a considerably increased speed.

The closing movements of the chucks and the operation of the clutch and brake are performed by power under control of a foot treadle. This rangement eliminates many gears and the work of moving heavy parts.



BLISS DOUBLE-SEAMING MACHINE

The chucks are bolted directly to face plate gears on the ends of spindles and this construction permits of the employment of a short connecting or driving shaft. The feed cams are driven by spiral gears from the spindles. The rocker shafts and arms are in one piece, insuring positive action. The drive is by bevel gear through a friction clutch and brake.

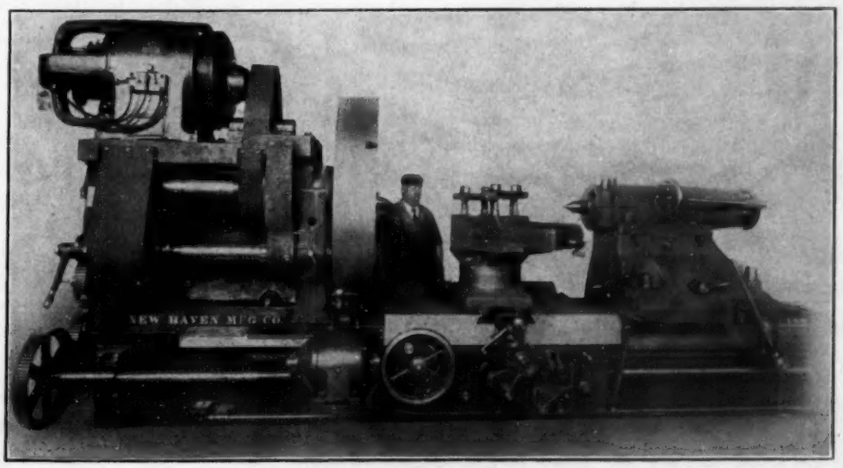
Adjustment for cams of different heights is made by the hand wheel on the upper head, which operates a lifting screw. The hand wheel is geared to the driving shaft, a tumbler bearing being provided and interlocked with the main clutch. The machine weighs 3,100 pounds.

A New, 62-Inch Lathe

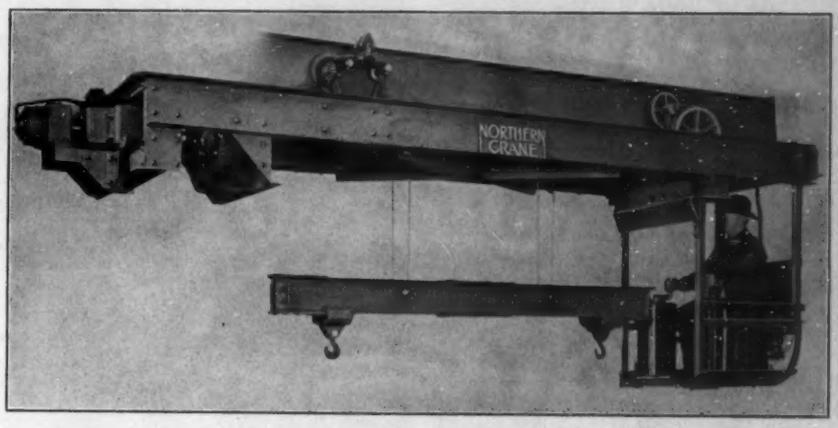
Rigid construction, together with powerful head drive and a wide range of speeds, have been combined in a new type of 62-inch lathe built by the New Haven Mfg. Co., New Haven, Conn. The machine is designed for either motor or belt drive and the lathe in the accompanying illustration is driven by a variable speed motor, a 2-horsepower motor being provided for the quick traverse of the carriage. The swing over the bed is 63 inches and over the carriage 49 inches. The length of the bed is 20 feet, distance between centers 9 feet, and the total weight, 48,000 pounds.

The carriage has long bearings on the V's and the compound rest has power-operated cross, lateral and angular feeds, controlled from the apron and is interlocking to prevent lateral or cross feeds from becoming engaged at the same time. The apron is of heavy double-plate construction and has a bevel gear drive from a slotted lead screw, with friction controlling all feeds. The design of the tailstock permits the base to be held to the bed by two binders having four bolts, while the top can be set over without the work dropping from the center. The tailstock is adjusted on the bed by a reversible spring ratchet lever with a pinion meshing in the feed rack. All sliding surfaces of the machine are hand-scraped to a bearing, and the cylindrical surfaces are ground. The ratio of the back gearing is 5½, 23 and 110 to 1 and the range of spindle speeds is from 1 to 70.

Probably not over 11 per cent of the energy in coal is effectively utilized, according to the bureau of mines. The remainder of the energy is lost through the inefficiency of the boiler, steam engine and dynamo.



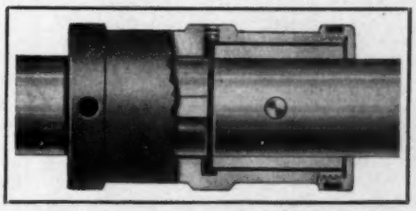
MOTOR-DRIVEN, 62-INCH LATHE



A DOUBLE HOOK MONO-RAIL CRANE

A New Flexible Coupling

A flexible coupling, shown in the accompanying illustration and made entirely of crucible cast steel, is being manufactured by McEwen Bros., Wellsville, N. Y. The keys extending through the shafts are set at right angles, and are arranged to permit considerable misalignment. Noise and



FLEXIBLE CAST STEEL COUPLING

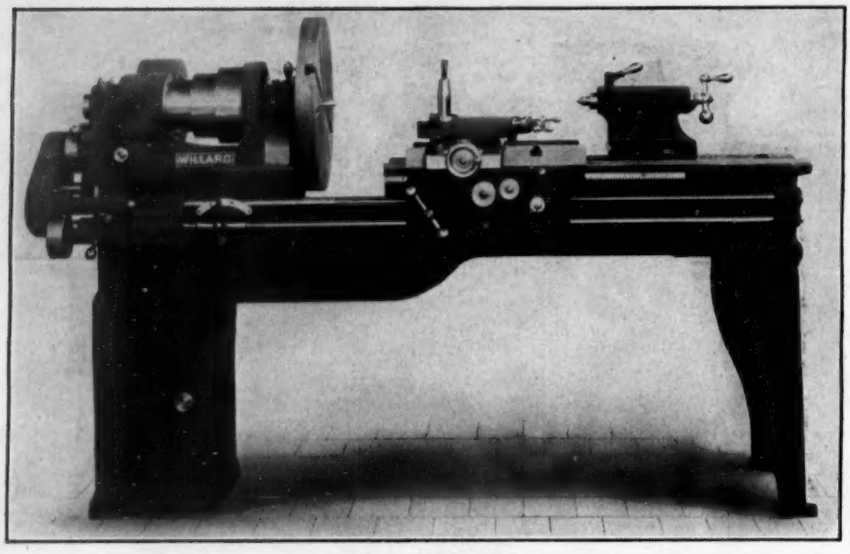
serious wear are guarded against by large bearing surfaces and lubrication from packing of heavy oil or soft grease. The design is claimed to be especially good for withdrawals parallel to the shaft axis, and only a small clearance is necessary for the removal of parts. The coupling has given good results on pumps direct-connected to steam turbines, but it is also adapted for service with blowers, motors, turbine and line shaft connections and on other machinery.

Double-Hook, Mono-Rail Crane

The accompanying illustration shows a double-hook, mono-rail crane or trolley hoist, recently built by the Northern Engineering Works, Detroit. The design illustrated is of two tons capacity, but the crane is made in sizes ranging from 2 to 5 tons. It is equipped with two hoisting drums and is operated with two motors. The 2-ton hoist has a hoisting speed of 30 to 75 feet per minute and a travel speed of about 200 feet per minute, with direct current motors. However, the apparatus can be equipped for alternating current.

The trolley portion, which travels on the I-beam, is designed to bring the lowest possible amount of strain and wear on the lower flanges of the beam. The hoisting mechanism is entirely enclosed, the gears are cut from steel and the bearings are of bronze. Current is supplied to the crane through third rail bars running along the mono-rail track, and a dynamic brake is used in connection with the solenoid electric brake. The lower lifting beam is equipped with sliding hooks which can be adjusted at varying distances to accommodate the loads to be handled. The trolley wheels are swiveled to permit traveling around curves, and if used for outdoor service, the cab is enclosed in steel and is fitted with windows. The hoist is adapted for handling all kinds of freight, long steel bars, tubing and other articles.

About 40,000,000 pounds of zinc oxide are used annually for a filling in automobile tires, and the remainder of the 60,000 tons, now produced yearly in the United States, is used chiefly in paint. In neither instance is the zinc ever recovered.



A GAP BED ENGINE LATHE

A Boiler Shell Drilling Machine

A new type of boiler shell drilling machine, shown in the accompanying illustration, is being built by the Baush Machine Tool Co., Springfield, Mass., in which the shell, after being rolled, is centered in a four-jaw universal chuck, capable of being rotated from the drilling position at the will of the operator. The latter is located in a cage which raises and lowers with the head, in this way maintaining a constant relation to the operating mechanism. The drilling spindle has a vertical travel, on the post, of about 10 inches, and a feed of 20 inches. The spindle is geared direct to a variable speed motor and the feed is geared direct to spur and worm gearing, provided with several changes by a jaw clutch.

Two large hand wheels, shown below the motor in the illustration, control the vertical adjustment of the saddle and the rotation of the chuck. The large hand wheel, in front of the one mentioned, provides a quick adjustment of the spindle, while the small wheel on top of it operates the clutch. The hand wheel on the shaft, parallel to the spindles, is a feed for hand drilling or facing. The machine throughout is furnished with roller and ball bearings, including the main bearings under the face plate, making the operation light and sensitive. The saddle is accurately counterweighted, and is raised and lowered by a screw, which is said to prevent its dropping. The chuck is 7 feet, 4 inches in diameter and is capable of being lifted off the table, the screws being provided with ball thrust bearings, to permit operating without difficulty. The table is fitted with T-slots and the chuck contains all the operating mechanism. This arrangement makes it easy to remove the chuck without adjusting any gearing, and the table may be used for strapping down ordinary plates to be drilled. The chuck is also arranged for clamping on the outside or inside of a boiler and is capable of handling shells from 36 to 72 inches in diameter and up to 10 feet high, at one setting, and by reversing, up to 20 feet long.

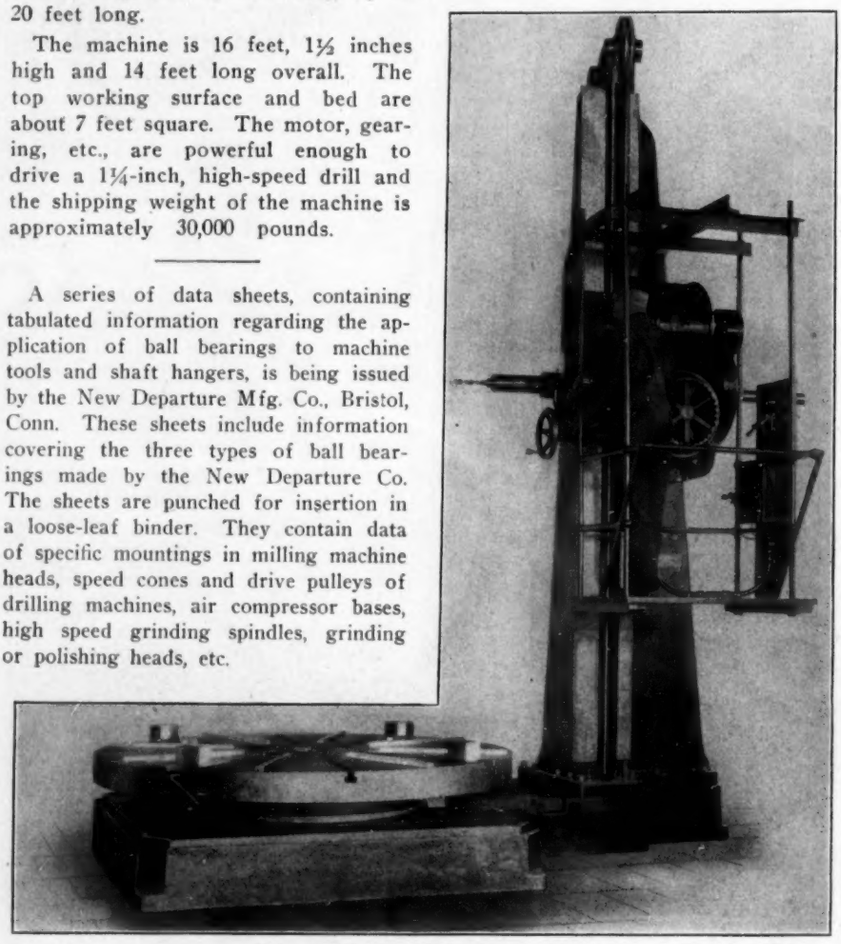
The machine is 16 feet, 1½ inches high and 14 feet long overall. The top working surface and bed are about 7 feet square. The motor, gearing, etc., are powerful enough to drive a 1¼-inch, high-speed drill and the shipping weight of the machine is approximately 30,000 pounds.

A series of data sheets, containing tabulated information regarding the application of ball bearings to machine tools and shaft hangers, is being issued by the New Departure Mfg. Co., Bristol, Conn. These sheets include information covering the three types of ball bearings made by the New Departure Co. The sheets are punched for insertion in a loose-leaf binder. They contain data of specific mountings in milling machine heads, speed cones and drive pulleys of drilling machines, air compressor bases, high speed grinding spindles, grinding or polishing heads, etc.

A Gap Bed Engine Lathe

The Willard Machine & Tool Co., Cincinnati, is building a gap bed engine lathe, which is designed for both jobbing and manufacturing purposes. The machine, shown in the illustration, has a swing of 21 inches in the gap, and will accommodate work 6½ inches wide in front of the face plate. To make the operation of the machine more convenient, the crank handle for moving the carriage has been placed at the left of the apron, instead of at the right, and a gib at the right of the apron stiffens the carriage when it overhangs the gap. The removable filling piece is fitted to a bearing in the gap, and when in position, transposes the machine into a standard engine lathe, with a swing of 13½ inches. The headstock and tailstock are the same as are placed on the company's standard 13-inch lathe.

The machine is provided with a three-step cone and double back gears, and the feed belt, which is 1½ inches wide, runs on large pulleys of equal diameter. A belt tightener is provided and four changes of speed are secured quickly by moving a lever



A BOILER SHELL DRILLING MACHINE

to one of four positions. The lead screws and feed rods are made from high carbon steel, bearings are phosphor bronze, reverse gears are steel, and the idlers are bushed with phosphor bronze. This lathe is furnished on either 6, 7, 8 or 10-foot beds, the weight with a 6-foot bed being 1,600 pounds.

Continuity of Electric Service

As a means of securing continuity of electric service, the General Electric Co., Schenectady, N. Y., is now making a locking device that is said to prevent effectually the blade of a disconnecting switch from opening except under the direction of the operator. Ordinary switches are sometimes thrown partly or entirely open by magnetic repulsion, with resulting disaster to the switch and the line. This safety catch forms a unit in itself and is applied by clamping it to a support placed between the clip block and the insulator cap. The device consists essentially of two brass bell cranks, hinged together at the ends of the two shorter arms and held closed by compression springs. The two longer arms have projections that close in front of the blade, preventing the latter from coming out of the clips. Each bell crank is provided with a dog which moves in a slot in the bell crank's elbow, the dog being hinged at this point. The springs press outwardly against the elbow of each crank and against the dog, keeping the bell cranks closed, and the dogs against the back of the blade. Withdrawing the blade of the switch from between the dogs causes the jaws to close automatically against the sides of the blade and to snap shut as soon as the blade is withdrawn completely. In closing, the jaws close automatically in front of the blade, locking the latter in the closed position.

Fire Under Automatic Sprinklers

The report of the Boston Manufacturers' Mutual Fire Insurance Co. for June shows a total of 74 fires in the selected risks which this company insures. The total fire loss in the 63 cases where the property was protected by automatic sprinklers was $11,013, or an average of $175 per fire. In the 11 cases where the property was not protected by automatic sprinklers the losses aggregated $41,131, or an average of $3,739 per fire. The ratio shows that the average loss where there were no sprinklers was more than 21 times the loss where sprinklers were installed.

Features of Wire-Drawing

In a paper entitled "Some Aspects of Wire Drawing," presented at the meeting of the Iron and Steel Institute, Percy Longmuir, Sheffield, Eng., stated that previous papers on wire-drawing have directed attention to three points, first, annealing temperatures, including physical condition of the rod; second, lubrication, and third, cleaning. In addition the following factors may be mentioned: Rate of flow, including amount of reduction per draft; contour of hole and efficiency of the coating on the wire. While there are other conditions, these six are said to be fundamental to the wire-drawing industry, and it is questionable whether they have received serious attention from the industry, except in isolated cases.

One of the chief features is the condition of the rod. If cold-working is to be effective, the rod must be uniform throughout its length. With the long lengths of today, perfect uniformity in the rod, as rolled, is impossible, and the finishing temperature of the back end necessarily differs materially from that of the front end. This results in a corresponding difference in the condition of the rod, the latter generally being found to increase in hardness from the beginning to the end of the coil. This difference between the ends may be comparatively light, but unless the rod is equalized initially throughout, its effects will be felt in the larger stages of drawing.

Industrial flow demands equality of section, and the reduction in area effected by drawing through a plate must, therefore, be uniformly consistent throughout the length of the wire. The general tendency is to put cold work on a hot-rolled rod before any normalizing has been effected, and in such cases the effect of cold-working develops a defect which persists through later annealing stages. This defect may take the form of non-sizing, that is, pulling out the hole, or acute local brittleness. In either case the wire-drawer usually blames the steel. Out of many cases investigated, the author stated that not one instance was found in which the composition has been at fault. In all cases the steel has been found to be correct and the manipulation wrong. One of the first studies in manipulation is that of obtaining physical uniformity throughout the length of the wire, and it is here that the least work has been done.

If the rod as hot-rolled is not in a state of equilibrium, then cold work intensifies, and to some extent fixes its condition, and later heat-treatment does not necessarily remove a fixed habit. The first care of the wire-drawer should, therefore, be that of effective normalization, and this may be attained by annealing. In either case the process must have some relation to the thermal transformation of the steel in question. A study of current wire-drawing practice shows that annealing operations generally have no relation to thermal transformations. Temperatures are rarely taken and the only guide is empirical judgment. The general range has been estimated to vary from 550 to 700 degrees Cent. Both temperature and time decrease with the reduction of the wire in size. This would indicate, according to Mr. Longmuir, that to some extent wire-drawers have recognized intuitively that only the effect of cold-working has to be removed and that, therefore, Goeren's low temperature annealing has long been recognized in practice.

The effectiveness of this annealing is open to question, and not only does the flow become less as the temperature decreases, but the resulting hardness is greater. Advantage of this can be taken when working to a definite hardness value in either cold-rolled strip or drawn wire. By a suitable adjustment of annealing temperature to cold work, a given hardness can be obtained, to a certain extent, irrespective of the composition of the steel. This emphasizes the fact that if annealing temperatures are to be studied seriously, a sharp line must be drawn between the first and the later annealings. The first annealing should relate solely to the condition of the hot-rolled rod, while later annealings have a relation to the stresses developed by cold-working.

A Long Wire Cutting Machine

A wire straightening and cutting machine, recently shipped to France by the F. B. Shuster Co., New Haven, Conn., has a capacity for cutting wire to a length of 67 feet. It is to be employed by a builder of reinforced concrete flooring and the wire is to be cut in lengths for use in the construction of floors of this type. The machine has a capacity for cutting wire 0.196 to ½ inch in diameter. The machine is approximately 75 feet long. Several years ago the F. B. Shuster Co. built a similar machine for cutting wire in lengths of 32 feet and up to the present time this was the maximum size built by this company.

Reviews of New Catalogs

MILLING MACHINES.—The Becker Milling Machine Co., Boston, has issued an illustrated leaflet, describing its vertical, single-pulley drive, milling machine. The model illustrated, is said to be a convenient size for the ordinary run of work.

AUTOMATIC STOKERS.—"Facts" is the title of a 47-page catalog, sent out recently by Walter B. Snow, publicity engineer, Boston, Mass., and devoted to the Taylor stoker, built by the American Engineering Co., Philadelphia. One illustration and a few charts are shown, but the pamphlet consists principally of reports of various tests made that have been conducted on these stokers installed in numerous plants throughout the country.

FOUNDRY EQUIPMENT.—Ph. Bonvillain & E. Ronceray, Paris, France, recently have issued two catalogs illustrating and describing their extensive line of foundry equipment. This includes cupolas of various types, reservoir ladles, cupola charging machines, brass melting furnaces, hoists, blowers, coremaking machines, core ovens, emery grinders, tumbling mills, electric separators, sand mixing machines and foundry supplies.

VERTICAL CHUCKING MACHINE.—H. Bickford & Co., Lakeport, N. H., have issued an illustrated leaflet, showing a 36-inch vertical chucking machine. The machine was designed to meet the demand for a low-priced tool for chucking car wheels, gears, pulleys, etc. The arrangement is said to make a strong, compact and self-contained tool with all bearings constantly in line. It can be furnished with a detachable chuck jaw or a special chuck table.

BOILERS.—The Columbiana Boiler Co., Columbiana, O., has recently issued a 46-page, illustrated catalog, showing its different products. The boilers include marine, horizontal tubular, portable, locomotive, and vertical. The company also makes air receivers, rendering tanks, riveted and welded galvanizing kettles and pans, welded tinning kettles, welded enameling kettles, annealing covers and shells, both welded and riveted, riveted pipe, foundry flasks and flask fixtures.

MANGANESE DIPPERS.—"The Missabe Dipper" is the title of a 16-page, illustrated catalog, recently issued by the Edgar Allen American Manganese Steel Co., Chicago. These dippers are made entirely of manganese steel. The body of the dipper is constructed of two castings, the front and back halves. The teeth are held rigidly by rivets and also by notches in the cutting edge of the lip, and by projecting offsets on the front casting. The dipper is made in all sizes and for all makes of steam shovels and dipper dredges.

PULMOTOR. — The Draeger Oxygen Apparatus Co., 422 First avenue, Pittsburgh, in a 32-page booklet describes the pulmotor, which is an automatic oxygen reviving apparatus for producing artificial respiration. The pulmotor has been added to the safety equipment of a number of blast furnace plants, steel works, mines, etc., where there is danger of workmen being overcome by gas. Numerous reports are contained in this catalog of revivals by the pulmotor of workmen who have been overcome and who otherwise might not have been resuscitated.

ELECTRICALLY - DRIVEN JARRING MACHINES.—An eight-page circular, issued by Henry E. Pridmore, Chicago, is devoted to motor-driven jarring machines made by this company, and some interesting illustrations are included of difficult work molded on this labor-saving device. These include a 1-ton crusher casting, the output of which was increased from one to four a day on this machine, and an ink roller, which is now molded in two hours, whereas by hand a molder and helper made one a day. Other intricate castings include a steel extension hub for a gasoline tractor, ashpit casting, bevel gear and automobile truck housing. A flask-raising device, equipped with a draw bar pattern, also is illustrated.

FOUNDRY CRANES AND EQUIPMENT. —The varied line of equipment and cranes for foundry use, built by the Whiting Foundry Equipment Co., Harvey, Ill., is illustrated and described in a 40-page catalog, recently issued. The types of cranes illustrated include a gantry equipped with a lifting magnet, stock yard travelers, traveling cranes for handling materials in foundries, hand travelers, wall bracket cranes, jib cranes, air hoists, overhead trolley systems, etc. Cupolas, cupola charging machines and other foundry melting department equipment are shown, as well as core ovens, core cars, etc., for core rooms. An extensive line of ladles also is shown, as well as cars, trucks, turntables, tumbling mills, brass furnaces, sand sifters, steel converters, malleable furnaces, etc.

STEAM TURBINES.—The De Laval Steam Turbine Co., Trenton, N. J., has issued a 117-page book, describing its various types of turbines. Many illustrations are given. The book is divided into five sections, the first two of which are devoted to the following subjects: The field of the single-stage turbine and considerations affecting the choice of type of turbine. The data contained in these two sections are largely general. The last two sections are entitled: Design and construction of the De Laval multi-stage turbine and the De Laval double helical speed reduction gear. As indicated by the subjects, these sections confine themselves entirely to details of the design and construction of the De Laval turbines. The book contains much valuable and interesting information regarding this type of power generator.

ROCK DRILLS.—Two booklets, issued by the Ingersoll-Rand Co., 11 Broadway, New York City, contain instructions for installing and operating the Temple-Ingersoll electric-air rock drills and the "5-F" Temple-Ingersoll electric-air drill. A 16-page bulletin also has been issued which is devoted to the Temple-Ingersoll electric-air rock drill, which is driven by pulsations of compressed air created by a pulsator actuated by a standard electric motor. The air is never exhausted, but is used continuously in a closed circuit. The drill consists of a cylinder containing a piston and rotation device and is geared to a motor, either direct or alternating current, which is mounted on a four-wheel truck for easy handling. Two short lengths of hose connect the pulsator and drill, which alternately serve as supply and exhaust. The "4-E" type of electric air drill is shown in another bulletin and will operate with either direct or alternating current. The cylinder diameter is 4¼ inches, 7-inch stroke, and will drill a 1¼ to 2-inch vertical hole up to 12 feet deep. The "5-F" electric-air drill will drill holes 1¾ to 3¼ inches in diameter and up to 20 feet deep.

Book Reviews

Energy and Velocity Diagrams, by Paul L. Joslyn, M. E.; 70, 6 x 9-inch pages; illustrated; published by the Gas Engine Publishing Co., Cincinnati, and furnished by THE IRON TRADE REVIEW for $2.

The aim of this book is to provide designers of large gas engines with methods of laying out energy and velocity diagrams for engines operating on blast furnace, producer or natural gas, with instructions as to their use, etc. For economy's sake, in work of this kind, it is necessary to plan everything in advance, as far as possible, and the data contained in the book are said to be the results of actual designing of some of the largent engines built in this country and Europe.

Structural Details of Hip and Valley Rafters; by Carlton Thomas Bishop, C. E.; 72, 7¾ x 10¾-inch pages; illustrated; published by John Wiley & Sons, New York City, and furnished by THE IRON TRADE REVIEW for $1.75 net.

The author states in the preface that the book is written to meet the requirements of structural draftsmen when solving problems in hip and valley construction. Complete directions are given for making the shop drawings for the steel work of intersecting roofs and similar structures. In many cases calculation has been simplified by tables. The book will undoubtedly find wide application in its field.

Annual Statistical Report of the American Iron and Steel Association for 1911—Part 2; 63 pages; published by the American Iron and Steel Association, Philadelphia. Part 1 and Part 2 of this report will be furnished by THE IRON TRADE REVIEW, Cleveland, postpaid, for $5.

Part 2 of this report is devoted to the statistics of the production of plates and sheets, black plates for tinning, nail plates, merchant bars, skelp tin plates, cut and wire nails, miscellaneous rolled iron and steel, etc., and foreign iron and steel, iron ore and coal. The domestic statistics complete in detail all the information contained usually in the annual reports issued by the American Iron and Steel Association. The statistics of foreign trade are exceedingly comprehensive and include a study of the iron and steel, iron ore and coal industries of many foreign nations.

MEN OF THE IRON TRADE

W. A. Carrell, a well-known engineer of the Pittsburgh district, is now associated with Edgar M. Moore & Co., Pittsburgh.

Percival Johnson has been named as general manager of the Pulaski Iron Co., Pulaski, Va., succeeding John W. Eckman, recently resigned.

Benjamin Davies, Youngstown, O., has been made chief electrician of the Martin, Pa., coke plant of the Republic Iron & Steel Co.

W. H. Yawkey, announces the removal of his offices from suite 825 Penobscot building, Detroit, to 200 Fifth avenue, suite 840, New York.

Byron R. Barden, president and treasurer of the Biggs Boiler Works Co., Akron, O., has been granted letters patent on an improved style of vulcanizer.

William W. Brierly has been appointed superintendent of the Millbury Steel Foundry Co., Millbury, Mass., to succeed Carl N. Nourse, who died recently.

J. F. Hartz, Detroit, has been made general manager and treasurer of the R-C-H Corporation, that city, maker of automobiles. Mr. Hartz is also president of the H. H. Hessler Co., Cleveland.

William F. Maguire is to be made vice president, and W. M. Anthony comptroller, of the United States Motor Co., according to an announcement of the reorganization committee.

Nathaniel Corry, of Amherst, N. S., president of the Canadian Car & Foundry Co. and largely concerned in other industrial enterprises, has been appointed a member of the Canadian senate.

Charles Blizzard, of the Noelke-Richards Iron Works, Indianapolis, Ind., has been elected president of the Traffic Club, which organization is a branch of the Indianapolis Trade Association.

William H. Donner, Pittsburgh, president of the Cambria Steel Co., Johnstown, Pa., has been elected president of the Johnstown Water Co., succeeding Charles S. Price, formerly president of the Cambria Steel Co.

C. E. Knoeppel, 761 W. Delavan avenue, Buffalo, announces the establishment of a professional consulting service in constructive organization and management. Mr. Knoeppel has had an experience of over 12 years as workman, draftsman, office manager, systematizer and efficiency engineer in a large number of industrial plants manufacturing widely varying lines.

Fred Krebs, formerly manager of sales of the Cambria Steel Co., Johnstown, Pa., has been elected vice president of the United States National Bank, at Johnstown, of which he has been a director since its organization.

Frank O. Hardy, of the William Hardy & Sons Co., which operates a brass foundry at Fitchburg, Mass., and who is now completing one term as mayor of that city, has been renominated by a citizens' caucus for a second term.

W. H. E. Roice, formerly general superintendent of the coke operations of the Republic Iron & Steel Co., Youngstown, O., at Uniontown, Pa., is now manager of the Connellsville Basin Coke Co., which has ovens at Rock Forge, W. Va.

Thomas J. Kelley, formerly secretary and treasurer of the Hartford (Conn.) Board of Trade, has been elected manager and secretary respectively of the Manufacturers' Association, of Hartford county, and the Employers' Association of Hartford.

B. Hardin Rowan, secretary of the Nashville Bridge Co., Nashville, Tenn., who is also secretary and treasurer of the East Side Improvement Co., of that city, and vice president of the E. T. Lewis Co., has been elected representative from the seventeenth ward of Nashville to the city council.

Alba B. Johnson, president of the Baldwin Locomotive Works, Philadelphia, addressed a large audience, last week, at the dedication of an addition to the Y. M. C. A., at Lewistown, Pa. The subject of Mr. Johnson's address was, "The Struggle for Life."

David White has been appointed chief geologist of the United States Geological Survey. He succeeds Waldemar Lindgren, who leaves Washington to become Rogers' professor of geology and head of the geological department of the Massachusetts Institute of Technology. Mr. White entered the geological survey in 1886, shortly after his graduation as a bachelor of science from Cornell university. Dr. F. L. Ransome succeeds Mr. Lindgren as chief of the section of economic geology of metalliferous deposits. Mr. Lindgren retains his position as one of the geologists of the survey.

W. C. Rott will succeed Walter Rachals, who resigned from the engineering office of Julian Kennedy, Pittsburgh, to become associated with Westinghouse, Church, Kerr & Co., New York. Mr. Rott has been resident engineer for Mr. Kennedy at the new plant of the Brier Hill Steel Co., Youngstown, O.

Archibald Johnston, vice president of the Bethlehem Steel Corporation, has returned from a business trip to Chili and other South American countries. While in Chili he closed a contract with the government for a large order for coast defense guns and ammunition to be manufactured by the Bethlehem Steel Corporation.

E. M. Adams, Akron, O., was elected president of the Ohio Society of Mechanical, Electrical and Steam Engineers for the ensuing year, at its twenty-sixth annual meeting held in Akron, last week. Mason Chilcote, East Liverpool, was elected vice president, and E. H. Jewett, Toledo, and David Gaehr, Cleveland, were elected managers.

Wm. H. Wright, superintendent of the coke department of the Zenith Furnace Co., Duluth, has tendered his resignation, becoming effective Dec. 15, and is to be associated after the first of the year with the United Coke & Gas Co., 17 Battery Place, New York. He has been in charge of the Duluth plant since the latter days of its construction in 1904 and was previously with the Illinois Steel Co. at its South Works.

Joseph Wolf, formerly of the Hisey-Wolf Machine Co., Cincinnati, has become interested in and is vice president and general manager of the Cincinnati Electrical Tool Co., maker of portable electrical drills and grinders. He will take entire charge of the management of the business, and will surround himself with competent heads in the different departments. The company will bring out several new and improved tools in the near future.

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Special Privilege for None—Not Even Labor Unions

Elihu Root is one of the few great men in public life today and the senator from New York has seldom said anything more important and impressive than he did when he addressed the Chamber of Commerce of the State of New York a few evenings ago, at its 144th annual dinner in New York City. The senator selected what he believed to be an opportune time for talking, a time when the minds of men are not disturbed, as they were for months, by the controversies of a presidential campaign. After the passing of the excitement and the noise and strain and stress, there is a period of rest, and the senator said it seemed to be a good time for national introspection. He inquired whether we are advancing in our capacities for self-government, and, after pointing out that he did not wish to say that the American people have gone backward, he continued:

"The misunderstanding—and when I say misunderstanding it implies erroneous ideas, and there are erroneous ideas, for there are hundreds of thousands of people outside the great industrial communities who think you are a den of thieves; there are hundreds of thousands of people who think the manufacturers of the country are no better than a set of confidence men."

This is almost a startling paragraph in a strong speech, and yet when one considers the agitation of the past few years, it is clear that the conditions described by the senator are natural results. There seems to be a general lack of confidence in business men, and especially in men who are connected with so-called big business. For example, the city of Cleveland expects to adopt a new charter for its government under the recently passed constitutional amendment providing for a large measure of home rule. Recently, Mayor Baker appointed a committee of nine citizens to select candidates from whom the people are to elect the authors of the new charter for the city. Naturally, one would expect that the tremendous manufacturing industries of Cleveland would have some representative in this list of candidates, but not a single one of the nine men selected by the mayor is connected with any important industry in Cleveland, and only one, and he a man of very radical views, is engaged in any kind of manufacturing. Politicians, labor leaders, preachers and lawyers form the committee, while the great manufacturing industries are ignored. Either the mayor is absolutely oblivious to the importance of the industries of Cleveland and to the abilities of the manufacturers, or he thinks the manufacturers cannot be trusted to assist in the framing of the charter for a great city.

But politicians and working people are not alone in misunderstanding men and conditions. Senator Root points out this fact very forcibly, when he says:

"On the other hand, there are many in this room tonight who, way down in their hearts, believe that great bodies of the American people really want to destroy their business and confiscate their property; that they are enemies to the men who are carrying on the vast business essential to our prosperity.

"Now, neither is true. One misunderstanding leads to conduct which seems to justify another in some respect. Nobody in this country wants to destroy business, to destroy prosperity. I say nobody; of course, there are always hangers-on in every country who would like to destroy everything—in the hope of picking up the pieces. But, speaking of the great body of the people, when they vote for measures, when they elect representatives, leading you to think they want to destroy prosperity, it is because they misunderstand you and when you think you misunderstand them.

"There is nothing more important today than by education and the spread of ideas such misunderstanding shall be disposed and done away with, and that all Americans shall come to the spirit of popular government in which every American desires the prosperity and the happiness of every other American."

Especially at this season of the year, when the festival of Peace on Earth, Good Will to Men, is approaching, representatives of all classes and those who belong to no class in particular may well pause and consider present conditions and then adopt the best methods of improving them. How can this best be done? Certainly no good can be accomplished by acting with any one who justifies crime. The declaration of a committee at the recent meeting of the American Federation of Labor that the McNamara offense in dynamiting the Los Angeles *Times* building was a social crime was practically an apology for murder. Employes cannot expect co-operation of employers if there is the slightest disposition to condone crime. Let that be set down first. Another important point is that labor cannot justly demand special privilege which is not granted to capital. If the corporations submit to anti-trust laws, so must the labor unions. The latest example of the unwill-

ingness of labor to submit to regulation similar to that of corporations is furnished by the action of P. H. Morrissey, who represented the engineers in the board of arbitration in the controversy growing out of the demand of 30,000 engineers for an increase of wages. Mr. Morrissey objects because he says that if labor were regulated by commissions as capital is by public service commissions, it would mean compulsory arbitration and that would be "wholly impracticable". The idea of many labor leaders seems to be that labor should be entirely without regulation. Even murders are attributed to society rather than to individual murderers and regulation is called "impracticable". Before there can be much progress toward better understanding between labor and capital, labor will find it absolutely necessary to submit to regulation just as corporations are doing. The general public welfare is paramount to the wishes of either capital or labor.

How progress toward better conditions can be made is illustrated by the thoughtful consideration given at the meeting of the National Founders' Association last week to many questions relating to working men, and especially compensation for injuries. The paper by G. W. Mixter, vice president of Deere & Co., Moline, Ill., is of great importance and we commend it to the careful perusal of our readers. That Mr. Mixter has considered the subject in a perfectly fair-minded spirit is evident and his conclusions will be helpful to all who are endeavoring to influence legislation in the right way.

With more of the broad-minded justice of such men as Mr. Mixter and less demand on the part of labor unions for special privileges, steady progress would be made in the wiping out of the deplorable conditions described by Senator Root.

Relative Ore and Pig Iron Prices

In the last eight announcements of Lake Superior iron ore prices, four of the announcements have involved advances, three have involved reductions, and in one case the previous prices were repeated. The ore prices have in all cases borne a direct relation to pig iron prices prevailing at the time of the announcement, but as the pig iron market has been passing through long swings upwards and downwards, there has not been the same close relation between average prices of pig iron during the periods in which the ore prices were in effect, and the ore prices themselves. Elsewhere in this issue our regular table is presented, showing the dates of fixing of ore prices from season to season, with the price of Bessemer and foundry pig iron in the valley upon the dates upon which ore prices were announced. It may be of interest to compare the average prices ruling for pig iron during the period from one ore price fixing date to the next. For this purpose basic pig iron, valley furnaces, is selected, and in the following table the average prices for basic pig iron are shown, the average being for the period from the date of the preceding announcement to the one indicated. Ore prices for 1905 were announced Feb. 1, 1905, and for 1906 on Dec. 5, 1905. In the table, the average price of pig iron in the first line, $15.03, is the average prevailing between those dates. From Dec. 5, 1905, to Nov. 5, 1906, the average was $18.34. From Nov. 5, 1906, to June 15, 1908, a period of slightly more than 19 months, the average was $19.79, and so on. Mesabi non-Bessemer ore is taken, as it involves the largest tonnage of the four groupings, and is the principal ore used in making basic pig iron.

MESABI NON-BESSEMER ORE AND AVERAGE BASIC PIG IRON.

Date of Ore Announcement.	Ore Price.	Pig Iron in Period Preceding.	Date of Ore Announcement.	Ore Price.	Pig Iron in Period Preceding.
Dec. 5, 1905.....	$3.50	$15.03	Dec. 24, 1909.....	$4.00	$15.85
Nov. 5, 1906.....	4.00	18.34	April 21, 1911.....	3.50	14.47
June 15, 1908.....	3.50	19.79	March 20, 1912.....	2.85	12.70
May 10, 1909.....	3.50	14.64	Nov. 19, 1912.....	3.40	14.25

The announcement of Dec. 5, 1905, constituted an advance, from $3.00 to $3.50. The average price of pig iron preceding the announcement was $15.03, while the average from that announcement to the next was $18.34, showing an increase of $3.31, which was in good form, as harmonizing with the ore advance. The next ore announcement involved another advance of 50 cents, and pig iron during the following period showed a further advance, which was also in good form. In fact, the announcement of Nov. 5, 1906, was in particularly good form, since it had higher pig iron behind it and found still higher pig iron in the future. The next ore announcement, June 15, 1908, involved a 50-cent reduction. While the average price of pig iron in the 19 months preceding was $19.79, the price at the moment was $15.25. The pig iron market declined further, but not much. The ore schedule announced Dec. 24, 1909, had particularly bad luck. The average price of pig iron preceding was $15.85, but the price at the moment was $17.00, and the price did not advance thereafter. In fact, the pig iron market had at that time already started to decline, after the spectacular advance from June to November, 1909, but the fact that a definite and important decline had set in was not recognized. The average price of pig iron from that date to the date of the next ore announcement, far from being in the neighborhood of $17.00, was only $14.47. It was a case of an ore advance being made and the pig iron market failing not only to respond, but even to hold steady.

Diametrically opposite conditions surrounded the announcement of ore prices for 1912, on March 20, last. The ore prices involved a very serious reduction. Pig iron had averaged $12.75 during the preceding 11 months, but was then showing a slight advancing tendency, and from that date to the fixing of prices last week the average price of pig iron was $14.25. Thus there was the curious case of ore being reduced and big iron being considerably higher in the period after the reduction than it was in the period preceding.

In the pig iron trade, there are frequently efforts made to show that the price should follow the price of ore. When ore prices have been announced at a reduction, pig iron buyers argue that pig iron should come down. When ore has been advanced, pig iron sellers insist that pig iron should advance. There is little support for such arguments in the statistics that have just been presented. Rather they tend to prove that the price of ore follows the price of pig iron. Sometimes an ore reduction is made and pig iron advances, while sometimes an ore advance is made and pig iron eventually declines, but the ore prices have always been in harmony with the market movement which pig iron has been showing. It is only natural that this should be the case. The price of ore naturally depends largely upon the demand, and the demand for ore is dictated by the course of the pig iron market.

Ups and Downs of Lake Superior Ore Prices

During Past Twenty-Three Years—Four Marked By Two Buying Movements—This Year's Start Earliest With One Exception

For a number of years the announcement of new prices of lake ore has come as a surprise, or at least with some unexpected features. This year the unexpected feature was the reduction of the prices 10 cents below those prevailing in 1911, as it was confidently expected that the full 1911 prices would again prevail. Seldom have the relations of the ore sellers been as harmonious as they have this year. No meetings were held and the consideration of ore prices was conducted in an entirely informal manner, in striking contrast with the animated discussions that took place years ago at the meetings of the ore men.

In 1911, the selling of ore for the season was precipitated on April 21, by the receipt of a telegram to THE IRON TRADE REVIEW, stating that the W. P. Snyder interests, of Pittsburgh, had sold 550,000 tons at a reduction of 50 cents from the prices of 1910, in which year, also, Mr. Snyder had fixed the prices. Last March the activity of Mr. Snyder hastened the opening of the market, but the first sales were made by Pickands, Mather & Co., who also opened the market for 1913 on Tuesday, Nov. 19, by the sales of several million tons at 10 cents below the 1911 prices.

Last year, in publishing the new prices, THE IRON TRADE REVIEW said: "One of the very interesting features of the new price schedule is that it practically wipes out the differential against the Mesabi ores. In the early days of Mesabi ores, furnace men were strongly prejudiced against them because of their fineness of structure and because it was believed that they were responsible for many slips. At first, Mesabi ores were almost a drug on the market, and in 1913 the differential was 85 cents, as old range Bessemer sold at $3.85 and Mesabi at $3. In 1894, the differential was 60 cents and it varied from 35 to 60 cents for five years up to 1900, when it became $1 and continued at $1 in 1901 and 1902. In 1903, the differential was 50 cents and since that time it has been 25 cents. The new schedule still apparently preserves the 25-cent differential, but in reality it is only 5 cents, because, on account of the reduction in freight rates on the Minnesota roads, Mesabi ores can be delivered at lower lake ports for 20 cents less than in past years.

"These figures are based on the official quotations of base ores. In some cases, however, when the finer grained Mesabi ores were first coming onto the market, there was a spread of $1.25 in prices, in favor of the popular old range ores. In 1900, the differential between some high grade old range Bessemer and certain Mesabi ores of fine structure ranged from $1.40 to $1.90."

This year, there is a differential of 25 cents between the old range and Mesabi Bessemers, and 20 cents between the old range and Mesabi non-Bessemers. This is likely to cause some controversy and doubt has been expressed as to whether it will be maintained.

TABLE SHOWING PERCENTAGES OF ADVANCES AND DECLINES IN ORE AND PIG IRON, 1903-1913.

Year.	Old range Bessemer.	Advance or decline in price.	Advance or decline in per cent.	Bessemer pig iron Valley.	Advance or decline in price.	Advance or decline in per cent.
1903	$4.50	.....	....	$21.50	.....	....
1904	3.25	—$1.25	—27.8	13.35	—$8.15	—37.9
1905	3.75	+ .50	+15.4	15.50	+ 2.15	+16.1
1906	4.25	+ .50	+13.3	17.25	+ 1.75	+11.3
1907	5.00	+ .75	+17.6	21.50	+ 4.25	+24.6
1908	4.50	— .50	—10.0	16.00	— 5.50	—25.6
1909	4.50	...	....	14.75	— 1.25	— 7.8
1910	5.00	+ .50	+11.1	19.00	+ 4.25	+28.8
1911	4.50	— .50	—10.0	15.00	— 4.00	—21.1
1912	3.75	— .75	—16.7	14.25	— .75	— 5.0
1913	4.40	+ .65	+17.3	17.25	+ 3.00	+21.1

SELLING PRICE OF IRON ORE AND PRICE OF PIG IRON AT DATE OF BUYING MOVEMENT

Season.	Date buying movement.	—Season Iron Ore Prices— Old range Bessemer.	Mesabi Bessemer.	Old range non-Bessemer.	Mesabi non-Bessemer.	—Iron Prices— Valley Bessemer.	Foundry Iron No. 2
1890	Dec. 15, 1889	$5.50	no sale	$5.25	no sale	$22.15	$18.15
1891	June 1, 1891	4.50	no sale	4.25	no sale	15.15	15.00
1892	Jan. 31, 1892	4.50	no sale	3.65	no sale	15.00	13.65
1893	March 15, 1893	3.85	$3.00	3.20	no sale	12.65	12.15
1894	March 1, 1894	2.75	2.35	2.50	no sale	9.65	9.65
1895	April 1, 1895	2.90	2.19	2.25	$1.90	9.40	9.40
1896	May 1, 1896	4.00	3.50	2.75	2.25	12.40	11.15
1897	May 20, 1897	2.60	2.25	2.15	1.90	8.35	8.40
1898	Mar. 20, 1898	2.75	2.25	1.85	1.75	9.55	9.80
1899	Febr'y 1, 1899	3.00	2.40	2.15	2.00	10.30	9.75
1900	Dec. 15, 1899	5.50	4.50	4.25	4.00	24.15	22.15
1901	April 15, 1901	4.25	3.25	3.30	2.75	16.15	14.40
1902	Febr'y 1, 1902	4.25	3.25	3.25	2.75	15.90	15.90
1903	Mar. 20, 1903	4.50	4.00	3.60	3.20	21.50	21.65
1904	April 15, 1904	3.25	3.00	2.75	2.50	13.35	13.15
1905	Febr'y 1, 1905	3.75	3.50	3.20	3.00	15.50	16.00
1906	Dec'm. 5, 1905	4.25	4.00	3.70	3.50	17.25	17.25
1907	Nov. 5, 1906	5.00	4.75	4.20	4.00	21.50	21.50
1908	June 15, 1908	4.50	4.25	3.70	3.50	16.00	15.00
1909	May 10, 1909	4.50	4.25	3.70	3.50	14.75	14.25
1910	Dec. 24, 1909	5.00	4.75	4.20	4.00	19.00	17.25
1911	April 21, 1911	4.50	4.25	3.70	3.50	15.00	13.75
1912	Mar. 20, 1912	3.75	3.50	3.00	2.85	14.25	13.25
1913	Nov. 19, 1912	4.40	4.15	3.60	3.40	17.25	17.50

History of Ore Selling

Price concessions have been made almost every year from the so-called official Lake Superior ore prices and this was true particularly of the non-Bessemer ores this year, although the schedule for 1912 was the lowest announced since April 15, 1904. The buying season for 1907 was the earliest on record, as it started on Nov. 5, just two weeks earlier than this year, and within a week practically all the ores for sale had been disposed of. Next to the early buying movement of the year 1907, came the years 1906, with Dec. 5, 1905, as the date of the buying movement, and 1890 and 1900, each with Dec. 15 of the previous years as the date of the height of the buying movements. Three years—1899, 1905 and 1909—were, like 1912, characterized by two buying movements. The year 1908 is conspicuous in the history of the ore trade on account of the refusal of the buyers to accept the prices named in February of that year, when the 1907 prices were re-affirmed for 1908. Owing to furnaces refusing to place their orders, prices were reduced 50 cents per ton on June 15, 1908. The buying movement which then started was the latest on record.

In 1909, many reservations were made during the early months and there was a little actual buying, but prices were not determined until May 10. In 1910, all the Bessemer ore available was reserved before prices were established and reservations were quickly turned into actual sales when prices were announced. Some non-Bessemer ore also was sold early, but sales of the remaining tonnage dragged throughout the year. The ore market this year moved rather slowly at the beginning, but the ore was rapidly disposed of during the spring and early summer, after the improvement in business got well under way. The second buying movement of the year, that for 1913 delivery, starts with heavy reservations of steel companies being converted into contracts, but the merchant furnaces are showing some hesitation.

Chart No. 1

The accompanying chart No. 1 shows the prices at which iron ore has sold during the 23 years beginning Dec. 15, 1889, together with the prevailing valley prices of Bessemer and No. 2 foundry pig iron at the date at which the ore buying movement was at its height. The idea, which was first embodied in the chart form in our issue of Feb. 21, 1907, is to establish in a graphic manner the relation of the raw material price to that of pig iron. During the past years up to 1909, barring some slight irregularities, the two series of lines have approached nearly to being parallel, showing that ore prices have

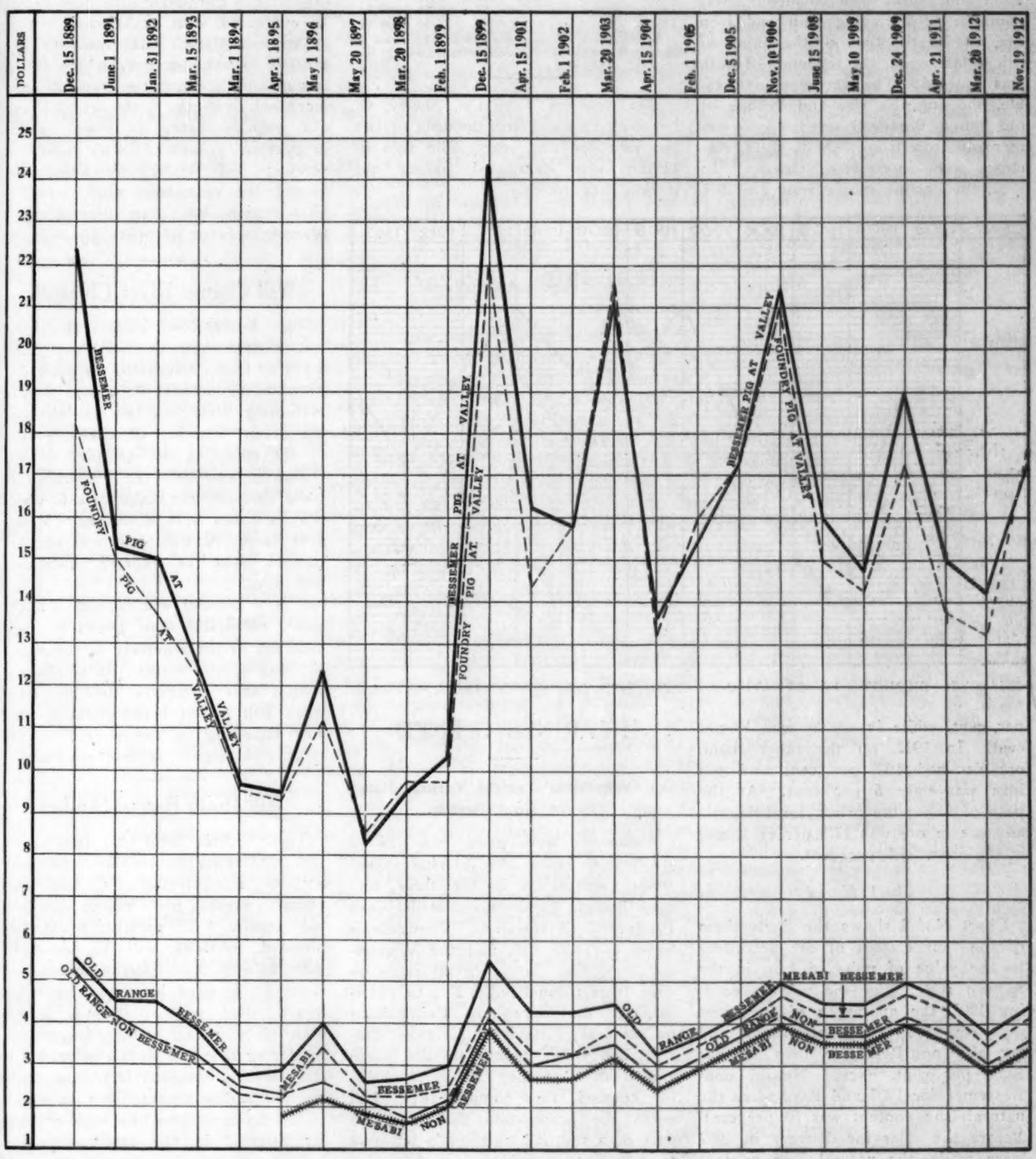


CHART I—FLUCTUATIONS OF PRICES OF IRON ORE AND BESSEMER AND FOUNDRY PIG IRON PER TON FROM 1889 TO 1913

declined with the prices of iron. This was not true in 1909, when the lines representing pig iron prices had a downward tendency while those for iron ore prices continued straight. In 1910, when ore prices were fixed, the lines for both pig iron and ore had an upward tendency, but later, in 1910, pig iron started downward and continued to decline throughout the year, the decline in Bessemer being $4.

At the time of the fixing of ore prices in April, 1911, and March, 1912, the downward tendency was common to both pig iron and iron ore, and at the time of the fixing of prices last week, the tendency of both was upward. The accompanying table, showing the rise and decline of old range Bessemer ore and Bessemer pig iron from 1903 to 1913, discloses some interesting statistics. In 1911, the decline in pig iron was 21.1 per cent, while in ore it was 10 per cent. In 1912, on the other hand, ore declined 16.7 per cent and pig iron was only 5 per cent. At the time of fixing the prices for 1913, the advance in ore was 17.3 per cent, and in pig iron, 21.1 per cent.

VALUE OF UNIT OF IRON FOR 11 YEARS.

	—Old Range—		——Mesabi——	
	Bes'm'r, cents.	Non-Bes'm'r. cents.	B's'm'r. cents.	Non-B's'm'r. cents.
1903.....	7.94	6.82	7.35	6.06
1904.....	5.73	5.21	5.29	4.73
1905.....	6.61	6.06	6.17	5.66
1906.....	7.50	7.01	7.05	6.60
1907.....	9.09	8.16	8.64	7.77
1908.....	8.18	7.18	7.73	6.80
1909.....	8.18	7.18	7.73	6.80
1910.....	9.09	8.16	8.64	7.77
1911.....	8.18	7.18	7.73	6.80
1912.....	6.82	5.83	6.36	5.53
1913.....	8.30	6.99	7.55	6.60

Fluctuations of iron ore prices expressed in values of units of iron in natural state.

The Seamless Tube Co., Shelby, O., has declared the fourth dividend of two per cent for this year. The sum of $35,000 was distributed among the stockholders recently.

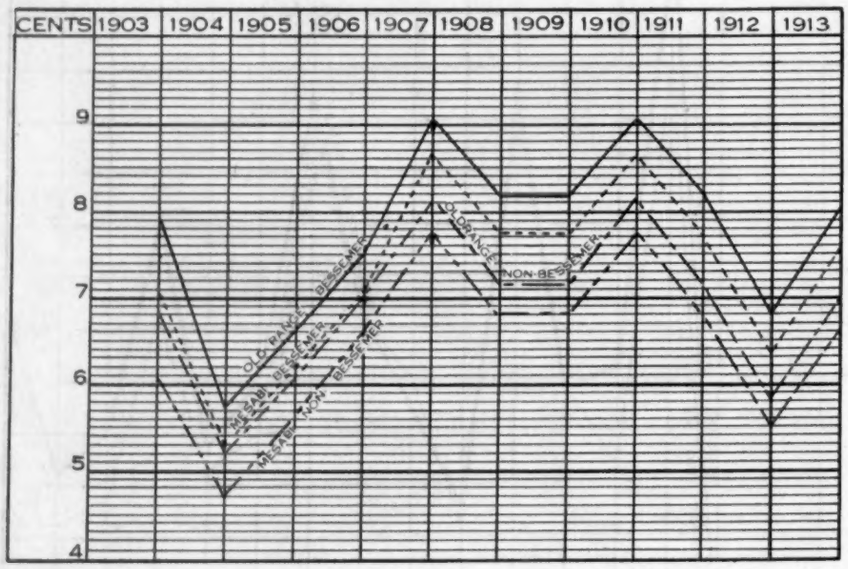


CHART II—SHOWING FLUCTUATIONS OF PRICES BY UNITS OF IRON, NATURAL

Chart No. 2

Chart No. 2 shows the fluctuations of the four classes of ore according to the value of units of iron in the natural state. For the years preceding 1907, the guarantee of Bessemer ores was 55.70 per cent natural and for the non-Bessemer ores it was 52.80 per cent, except Mesabi non-Bessemer for 1905 and 1906, when the natural iron content was 53 per cent. Before the sales for delivery in 1907 were made, the natural iron content for the base was changed to 55 per cent for Bessemers and 51.50 per cent for non-Bessemers. No change has since been made. The fluctuations in unit prices have been as follows:

HEARINGS OPENED

On Complaints Against Various Rates From Connellsville.

Arguments were made Nov. 25 at Washington before the Interstate Commerce Commission in the three rate cases brought by the Connellsville Coke Producers' Association, Youngstown Sheet & Tube Co., and the Wisconsin Steel Co., involving 20 rates on coke from Connellsville, Pa., to Philadelphia, Baltimore and Phillipsburg on the east; Pittsburgh, Chicago, Buffalo and other points to the north and west. Attorney Wade H. Ellis, of counsel for complainants, laid down the proposition that it is no part of a railroad company's business to take into consideration the value of a commodity transported except as the value affects what may be called "the insurance" part of the rate; that is, the part imposed on account of the risk of damage claims arising. In closing his argument, Mr. Ellis said that it is clearly the duty of the commission at least to remove the discriminations made in favor of the Fairmount district, and of the by-product ovens in Chicago. On seven grounds, Mr. Ellis based his demand for a reduction in the railroad carrying rates. They were: The rates are unjust by comparison with others; unjust compared with coal rates; as compared with other coke rates; as compared with coal rates to by-product ovens, because, while facilities making a cheaper movement have increased, yet the coke rates have also gone up instead of down; out of proportion compared with cost of service; and finally, by agreement among the defendants the Connellsville region has been discriminated against in favor of other districts.

Will Change River Channel

The Youngstown Sheet & Tube Co., Youngstown, O., will secure 69 acres of land adjacent to its works, if its plans to change the course of the Mahoning river are successful. At the recent meeting of the directors of the company, the question of exchanging land with the Pittsburgh & Lake Erie and the Lake Erie & Eastern railroads was discussed. President James A. Campbell was authorized to make the transfer along certain lines.

A new channel will be dug for the river, increasing the available land holdings of the company at the western end of the works. It is not expected that contracts for the river work will be let before next spring. The changing of the course of the river will require several months.

Will Build Rescue Station

The Cambria Steel Co., Johnstown, Pa., continuing its commendable policy of safeguarding its employes, plans to erect a mine rescue and first aid station. If present plans are adopted, stations will be equipped with helmets and oxygen-tank knapsacks to be used by men who enter mines filled with poisonous gases. Men already are being educated in rendering first aid to the injured and the Cambria company is training both its mill and mine employes. Officials of the Cambria company took particular interest in the recent visit to Johnstown, of the mine rescue car of the United States bureau of mines.

BRITISH AND CONTINENTAL MARKETS

BRITISH IRON TRADE

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Nov. 15.

Pig Iron.—The Balkan situation resulted early in the week in forcing down prices, but there has been a complete recovery and Cleveland No. 3 pig iron is now held at 67s 3d ($16.46). However, the trouble in the Near East, combined with very high freight rates, has checked shipments and stocks now stand at 250,000 tons, a slight increase over the first of the month. Domestic consumption is enormous and shows no signs of relaxing. Consumers in the Midland district who delayed placing contracts are now facing an increase in the selling figures of 2s 6d per ton. Coke is very expensive, coke makers attributing this condition to the high prices and scarcity of coal. Colliers have received a 5 per cent advance and will ask for like increases in both January and March. On forward buying makers still obtain 1s 6d on present prices. East coast hematite is still strong and iron is practically unobtainable on new orders for this year's delivery. Lack of men prevents the starting of more furnaces in the northwest district.

Finished Iron and Steel.—A "bear" movement on finished material has been partially successful, galvanized sheets, for example, being lower. All mills, however, are fully engaged. German competition is affecting the prices on wire, although transit trouble has restricted German shipments. Railroads in England as well are finding difficulty in meeting the demands made upon them. Works in the steel department are busy and there is a confident tone in evidence. Steel sheets are weak, owing to competition from Belgium.

RUSSIAN IRON TRADE

(Special Correspondence)

St. Petersburg, Nov. 14.

Labor is scarce in South Russia. Coal is very dear and coke is in good request at 20-22 copecks (10 cents to 11 cents) per pood (36 pounds) and the demand greater than supply; so much so that the Briansk Metallurgical Co. has had to buy German coke. Four fresh furnaces have been lighted and have difficulty in supplying the demand for raw metal. The labor difficulty which is to some extent accounted for by the withdrawal of reservists with the partial mobilization reported some time ago, will be eased, of course, when the reservists are dismissed to their homes again. but no one can tell when that will be. The production of coke this year has been greatly in excess of that of last year, and approaches an increase of about 80 per cent over the production of 1910, and there is no sign yet of tranquility in South Russian iron business.

GERMAN IRON TRADE

Berlin, Nov. 15.

The German iron market continues sound, although political conditions have had rather more influence of a bad kind during the past week than your correspondent has had to record hitherto. New business is rather quieter and in many departments distinct hesitation is to be noticed. The industry is still laboring under considerable disadvantage in not being able to secure the dispatch of raw material fast enough owing to the lack of railway wagons.

Pig iron, however, continues very firm in consequence of the scarcity of supplies, which are inadequate despite a new high record in the output during October of 1,589,262 tons, compared with the previous highest of 1,487,448 tons in August last, 1,479,285 in September, and 1,334,941 tons in October, 1911. The monthly production has thus for the first time in the history of the German iron trade passed the 1½ million mark. The Russian government is reported to have reduced the import duty on pig iron from Upper Silesia owing to scarcity in Russian Poland. Prices for all descriptions on the Dusseldorf Exchange have been advanced to 100m ($23.50) except in the case of English hematite, which is now quoted 98m ($23.03) to 100m ($23.50), against 94m ($22.09) to 97m ($22.79); and Luxemburg foundry iron No. 3 being now 63m ($14.81) to 65m ($15.27), against 60m ($14.10) to 62m ($14.57). Spiegel iron is now quoted 82m ($19.27) for 10 per cent to 12 per cent manganese ex Siegen; German Bessemer 81.50m ($19.15), German foundry pig iron No. 111 74.50m ($17.50), and German hematite 81.50m ($19.15). The pig iron stocks of the furnaces on Oct. 31 have been reduced to 245,000 tons against 298,000 tons on Sept. 30, and 551,000 tons on Oct. 31, 1911; the present stocks thus represent a production of about 5½ days. According to preliminary estimates the shipments of half-products by the Steel Syndicate during October amounted to 160,100 tons (September, 1912, 152,449 tons), of railway requirements 197,000 (179,152), of shape iron 175,000 (178,483), making a total of 532,000 tons against 510,084 tons in September, and 472,096 tons in October, 1911.

BELGIAN IRON TRADE

Brussels, Nov. 15.

The metal market is undecided in some respects, but orders in hand assure the working of the factories for a long time. Steel bars are quoted six pounds ($29.20) to six pounds two shillings ($29.80), and rods are six pounds three shillings ($29.93) to six pounds four shillings ($30.17). Iron plates continue quoted at six pounds 17 shillings and six pence ($33.442), steel value six pounds 15 shillings ($32.84) for quarter inch thickness, six pounds 18 shillings ($33.57) for one-eighth of an inch, and seven pounds three shillings ($34.80) for one-sixteenth. In the country, steel bars are dealt in at 16.50 francs ($3.13), 15.50 francs ($2.94) and 15.75 francs ($2.99). Eighteen francs ($3.42) are paid for steel plates. Respecting an order given by the State Railways for rails a few days ago, this order amounted to 60,000 tons of 50 kilos per current metre, 36,000 tons of 57 kilos, and 7,800 tons of 40 kilos, 650 per current metre. The total order amounts to 103,800 tons plus corresponding accessories, making 12,492¼ tons of fish plates, sole plates, etc. The foregoing is deliverable at various periods up to October, 1913. This is held to insure regular work for the rolling mills up to the end of the third quarter of the coming year. There were 49 furnaces in blast on the first of November against 43 on the first of November, 1911.

Man Too Good for Politics Is Not Good Citizen

Said Henry M. Leland at Convention of National Founders' Association — Methods of Improving Conditions of Labor Considered

"Business Men Into Politics" as the most effective method for checking pernicious labor legislation and for preserving the square deal for business interests, was the slogan of the sixteenth annual convention of the National Founders' Association, held at the Hotel Astor, New York City, Nov. 20 and 21. The officers in their reports and the members who addressed the convention, concerned themselves with the great unrest in the industrial world at present and with the impending carnival of proposed laws which are aimed to interfere with the rights and liberties of manufacturing producers. The work of the union agitator, of the demagog in public life and of the practical politician with no financial interest in business enterprises, was reviewed and denounced. The ringing opinion was generally expressed that the business men of the country have only themselves to blame for prevailing conditions by their indifference and half-hearted participation in public affairs. According to the reports of the national commissioner, the past year has been the most productive of unrest among foundry labor since the stirring days of 1906 and 1907. The association at the convention gave much attention to voluntary and compulsory methods for bettering the working conditions in the foundry trade, including employers' liability, workmen's compensation, sanitary conditions in shops, and kindred subjects. A committee was appointed to study the subject of safety and sanitary appliances in foundries and to report in recommendations looking towards the standardization of the best methods and devices. The attendance at the convention numbered about one hundred and fifty.

President O. P. Briggs, in his annual report, reviewed the government eight-hour day, the proposed investigation of industrial conditions by a special commission, the progress of employers' liability and workmen's compensation and other proposed important labor legislation, besides summing up the routine events of his administration. Upon these various subjects, he said in part:

The government eight-hour law goes further in establishing a shorter work day than anything we have yet seen, and shows clearly what the campaigning effort of radical labor unions will accomplish. The eight-hour law heretofore applied to government work is now extended to all contractors and sub-contractors, and sub-contractors of sub-contractors, way down the line to the last man who furnishes anything by virtue of the original contract.

The unions have been boasting ever since this law was enacted that it is only a question of a short time when the same schedule of hours will be extended to all private contracts, the United States government having taken the initiative. As they present the case to their listeners, the United States government having been forced by them to adopt eight hours, the next step to private contracts is easy. It is surprising to note the extent to which they carry this argument in their union debates and the readiness with which a very large number of our working people believe their statements are correct. I know of no greater injury that can befall a workingman than that which deprives him of his right and opportunity to convert his labor and as much of it as he wishes into the necessities of life. His labor is the only asset he possesses, the only resource from which he can earn money to support and bring up his family.

Nor is a consideration of this subject complete without analyzing the position of the consuming public. To whatever degree the hours are reduced, the cost increases. Even if the hours were not already set at as low a point as is consistent, it would certainly seem that this is not an opportune time to increase the price of commodities, in the face of such opposition as we already have to the present cost of living.

Closely related to the question of hours, comes the improved methods of manufacture brought about by the introduction of labor saving machinery and devices. I have often said to you that there was a time when the working hours were too long, and with the greatest of pride have I referred, and now refer again, to the fact that members of the Founders' Association were among the first to reduce working hours to the present schedule, which I believe to be a just one.

The law creating an industrial commission was enacted at the last session of congress. It contemplates a thorough investigation of industrial conditions throughout the United States. It provides for a committee of nine, three from organized labor, three from the employers, and three disinterested parties, to be appointed by the president, with the consent of the senate, at an early date. The first appropriation for this commission is $300,000. They are empowered to subpoena any one, investigate wherever they please to such an extent as they see fit, and are directed to make their report within three years. This investigation had its inception in the minds of the union. It is now a law, and will be put into effect promptly. It behooves every employer in this country to take an active interest in getting before this commission actual prevailing conditions.

Officers for 1913

President — O. P. Briggs, Minneapolis.

Vice President — J. H. Schwacke, Wm. Sellers & Co., Inc., Philadelphia.

Secretary — J. M. Taylor, Chicago.

Commissioner — A. E. McClintock, Chicago.

Treasurer — Chicago Saving Bank & Trust Co., Chicago.

Employers' Liability and Workingmen's Compensation

This association enjoys the distinction of being one of the first to investigate this question. It is true, as an association it has never committed itself to any specific measure. There have been times when in the minds of a great many, we were thought remiss in our duties in remaining silent. Subsequent events have proved, however, the wisdom of this silence. Up to date there has been no legislation introduced in this country which seems entirely satisfactory, but with the experience of the several states that are now operating with such laws available, I believe the association will very shortly be in a position to endorse and recommend the proper kind of legislation.

Business Men in Office

And now we come to the question of the representatives of all of us who are sent to our congressional and legislative assemblies to enact laws. Right here you find the difficulty. It has been estimated by people whose

judgment ought to be good that out of the 531 representatives and senators at Washington, we have not to exceed 50 who can be considered business men. With all due respect to the entire number, how can this body be competent to pass upon such questions with so small a number of experienced men among them?

Mr. Briggs expressed regret of the association at the resignation during the past year of F. W. Hutchings, as secretary of the association. The association had been fortunate, however, President Briggs stated, in obtaining as Mr. Hutchings' successor, J. M. Taylor, the president's secretary, who has been connected with the association almost since its organization and formerly was the official manager of the New York office. D. B. Hinckley is now in charge of the New York office. Upon the change in the secretaryship, the council decided the best interests of the association would be served by having the commissioner and secrtary in the same office. To that end the Detroit office was closed and the commissioner's and secretary's offices were combined in new quarters in Chicago. This necessitated a new office force and a change of the treasurer.

Commissioner's Report

The report of Commissioner McClintock declared that the foundry industry during the past year had experienced a greater degree of labor troubles than at any time since the memorable conflict of 1906-07. During the year the association lent its support in combating strikes to 21 members. Of these strikes, 15 were caused by refusal to recognize the union; three by refusal to permit the union to control molding machines; one by refusal to abolish piece work; one by refusal to recognize union apprentices ratio and one was a sympathetic strike. During the same period the molders' union prosecuted strikes against 68 shops not members of the association, from which approximately 2,729 molders and core makers went on a strike. All the strikes brought against members of the association resulted in the defeat of the union. Commissioner McClintock attributed the unusual unrest in labor circles to the betterment in trade conditions and the ceaseless effort of the paid agitators. He covered the subject of shortages of molders, women core makers and of improvement in the sanitary conditions of the foundries as follows:

Until a greater and more widespread attention is given the subject of educating men and boys in the molding trade, we are bound to have a shortage. The scarcity of molders has been particularly marked during the past four months. The foundry tonnage capacity of the country is being largely and constantly increased. This is particularly true with shops devoted to agricultural, malleable and steel castings. The representatives of the association have urged the introduction of molding machines, and the employment of handymen with all the persuasive force they possess, but there is still much room for improvement.

Now that the demand for workmen in out-of-door employment is lessening, the present winter months are opportune for action along the lines referred to. Of one thing we are all certain—the available supply of molders will never be sufficiently increased until the foundrymen educate them, and the longer a proprietor depends upon the other fellow to do the educating, the worse this condition will become.

The Lesson of Los Angeles; Will the Public Grasp It?

One year ago, the eyes of the country were centered upon the McNamara cases at Los Angeles. Everybody was interested. Much speculation prevailed as to the guilt or innocence of the parties, and as to whether the result of the trial would be an acquittal or a conviction. We all breathed more freely when the McNamaras confessed, and I believe a large percentage of our people directly affected by unionism entertained the hope that with so complete a confession as was made in this wholesale dynamiting outrage, those union leaders who had so vociferously championed the cause of these culprits, would lose their prestige and their hold upon public opinion. That this hope was in vain is best illustrated by the fact that the very same labor leaders who shouted from the house-tops the innocence of the McNamaras and their followers, were the men who secured at the hands of congress the pernicious labor legislation it inaugurated last season.

At the present time, we are all watching with intense interest the trial in the federal courts of 49 as accomplices of the McNamaras. From the evidence already reported, it would seem as if the case is as complete and convincing against these 49 as it was against the McNamaras. Again we raise the question—Suppose they are convicted, will this further exposure of wholesale dynamiting by one of the principal American Federation of Labor unions be sufficient to change public opinion?—PRESIDENT BRIGGS.

The employment of women in the making of small cores is increasing in importance—likewise the opposition of the molders' union is becoming more pronounced. In the production of small cores, where large quantities are used, there is a legitimate field for women, provided proper accommodations are furnished. While in this country the practice of employing female coremakers dates back 40 years, yet it is only in recent years that the total number has become an important factor.

Officers of the molders' union have endeavored to raise a great hue and cry about women working in foundries under "atrocious conditions". In Massachusetts last spring a campaign of agitation was started. A bill was introduced in the legislature to prevent the employment of women in corerooms, and the governor appointed a commission to investigate. Every foundry in that state employing female coremakers was visited, but the conditions complained of were not found, and the commission so reported. However, to prevent abuses creeping in in the future, a bill providing proper and special sanitary conditions was proposed and passed with the hearty approval and support of the foundry proprietors. We are informed the molders' union did its utmost to block this legislation, and fought for the original bill to bar women from corerooms.

I believe I voice the sentiment of the membership of this association when I say that we are not in sympathy with any attempt to place women in positions requiring heavy lifting or hard muscular labor, and heartily favor regulation having to do with proper sanitary conditions, but we do oppose the attempt of the molders' union to drive out women coremakers from profitable and agreeable work, solely to put in men whom they hope to make contributors to the union's exchequer.

The providing of better factory conditions is something which is taking a firm hold of the employers of this country in every line of manufacture. Foundry proprietors are spending much thought and money in an earnest effort to improve their shops. As an outgrowth of employers' liability laws, some of our members are requiring applicants for employment to pass a physical examination. Having engaged a workman in good physical condition, they are making every effort to prevent accidents, and by proper heat, light, ventilation and wash room facilities, at least do their part in keeping him well and strong.

Secretary's Report

Secretary Taylor reported that in compliance with the resolution of the last convention, the circulation

of *The Review* had been increased and on an average of 7,000 copies per month had been issued. A certain number of copies have gone each month to machinists. Mr. Taylor emphasized the necessity of education of the honest-thinking mechanic against radical closed-shop unionism and to combat the effect of the thousands of socialistic and partisan union publications that now find their way into the homes of the workmen. He believed that the workmen should be led to the truth in this educational campaign without antagonism and that each statement made should be capable of verification. Mr. Taylor told of the efforts of *The Review* to get the truth before the workingmen in clear, convincing style and to treat upon those subjects in which the latter is most vitally interested, including shop conditions, compensation, etc.

Foundry Trade is Practically Normal, Says President Briggs

"The unexpected has happened during the year we now close. The presidential year depression did not appear in so pronounced a manner as usual. On the contrary, a revival of business took place, which is seldom experienced in a presidential year. In all probability the foundry business for the past six months has been nearly up to its normal stage. Some believe it is but temporary, being brought about by the heavy purchases of equipment by the railroads to move the abundant crops; and they hold that as soon as these temporary demands are filled, the same prosperous condition will not long prevail. Time alone will determine this. Our hope is that the experiences of the year just closed will establish a new precedent for the future, that the idea which has prevailed for so many years that a presidential election presages business depression will be dispelled, and that during this period, as well as at other times, the demands of the country will be cared for, and its business move on uninterrupted."

Illinois Compensation Act

G. W. Mixter, vice president of Deere & Co., Moline, Ill. in treating of the subject "Liability-Compensation-Responsibility," outlined several years' records and investigation made of accident conditions in the shops of the company and the conclusion that impelled the management to accept the workman's compensation act in Illinois. Since May 1, 1912, Deere & Co. have operated under the Illinois law. He told of the practical results obtained in that brief period. Mr. Mixter's paper was most illuminating to employers, as a practical application of a state compensation law and its probable future results gaged by a concise record of shop accidents over a term of years.

Pertaining to the experience of Deere & Co., Mr. Mixter said:

The company had operated in its largest Illinois plant for over three full years, a sick benefit and accident fund, the cost paid—one-half by the company, one-half by the employes. A result of this was an exact record of every accident in the plant during the calendar years of 1909-10-11, and a reasonably wide, though brief, experience with the attitude of the employes toward compensation.

The present Illinois law, enacted in 1911, became effective May 1, 1912. The manufacturing organizations of Deere & Co. today employ about 4,000 men in the state of Illinois. The Illinois statutes permit employers to choose between acting under the compensation act, or acting under the common law as in the past, with the three statutory defenses removed. The company, therefore, about a year ago, was obliged to determine what its position would be in the matter. Manufacturers, both locally and throughout the state, expressed condemnation of the act. The company, therefore, analyzed as far as possible what the accidents during the three years of record would have cost under the new act.

The speaker then outlined the salient features of the Illinois law and the results obtained and analyzed the accidents of Deere & Co. for the years of 1909, 1910 and 1911, as they would have been affected by the compensation act. The wages were taken as 27½ cents per hour or $2.70 per day and the average period of employment was assumed at 250 days per year. The record of accidents, as given under the Deere & Co. insurance records, for these years, was taken from only one of the company's plants, the plow department. The total compensation provided by the Illinois act for the three years covered would have been $33,003.44. The payroll for this period was $3,654,552.58. The compensation estimated as accruing under the Illinois law was, therefore, 0.96 per cent, plus probably 0.25 per cent for administration, or a total of 1¼ per cent of the payroll. The records show 304 accidents and an average number of 1,276 employes in 1909; 719 accidents and an average of 750 employes in 1911. The high average for 1910 was due to night work and overtime.

"It is probably not fair to assume that future costs under the act will be as low as indicated above, but even with very liberal increase, the cost is widely different from the liability company's rates," said the speaker. Continuing, he said:

As a result of the analysis, Deere & Co. accepted the compensation act of Illinois, and have operated all of their factories in Illinois under the act since May 1, 1912.

The number of accidents, as shown by record for 1911-12, May, June, July, August, September and October, have not increased.

Nineteen hundred and eleven—Average number of men working, 1,392; accidents, 283. 1912—average number of men working, 1,458; accidents, 309.

There has been no trouble with the men prolonging the period of disability. All have returned to work when notified to do so by the company's surgeon.

In all minor cases, our interpretation of the act has been taken without question. In fact, very few have read the act, and fewer understand it. We have settled all cases except one.

The estimated cost for all accidents, with one case unsettled, has been $4,500, or 0.84 per cent of the payroll, or at the rate of $6.16 per man per year.

Six months is a rather short period in which to base an opinion, especially when the act is so little known and understood by the employes in general; but my opinion is that if specific benefits for permanent injuries were incorporated in the present act, which we could definitely refer to in talking with the men, then the act would work successfully here—at least until the character of our men changes. Without such a change in the act we will certainly have more or less trouble with the serious cases, without especial advantage to the men.

Mr. Mixter's Conclusions

After reviewing the English and German compensation laws with some comparisons with the Illinois act, Mr. Mixter summed up the subject with the following conclusions:

(1) Compensation is a right development of modern industrial organization. It is a part of the labor problem, which employers must approach sympathetically and work to solve both for the interest of the employe and the employer.

(2) The Illinois act is reasonably just to large employers, but lacking in that definiteness which would benefit both employe and employer.

(3) Accepting the Illinois act should at present cost an agricultural

implement plant, carrying its own risk, about 1 per cent for compensation, or an outside figure of 2 per cent, including administration and usual accidents.

(4) Germany teaches us to avoid red tape. Red tape costs money. Keep the direct contact between employer and employe; avoid having the employe look to the state. Do not permit compensation for accident to be confused with other social insurance. Cost for accident compensation ranges from 1 per cent to 2½ per cent.

(5) England shows clearly the less favorable development of employes under compensation. The bad labor conditions affect the attitude toward compensation. Such conditions are not prevalent in the United States today, and we employers are largely responsible whether we have such conditions tomorrow. The cost in a typical English plant is 1 per cent of the payroll. (Iron works.)

(6) *In General*

In the interest of both employe and employer have laws enacted or amended that provide definite sums and definitely terminating benefits, with procedure of settlement directly between employe and employer.

Spend money to avoid accidents.

Employ a competent company surgeon, regardless of what the law demands.

Keep close to the men legally and personally, and compensation will not injure your business.

The Massachusetts Law

M. W. Alexander, of the General Electric Co., Lynn, Mass., spoke of his observations on the subject of workmen's compensation as a member of the Massachusetts commission appointed to supervise the operation of the law in that state. He expressed the opinion that the cost of liability insurance should not exceed employers' liability. The subject was also discussed by Thomas E. Durban, of the Erie City Iron Works, Erie, Pa., who thought that workmen's compensation should apply to all classes of employers, including farmers, and by Theo. O. Vilter, of the Vilter Mfg. Co., Milwaukee, Wis.

National Legislation

Marshall Cushing, representative of the association on national legislation, outlined the enactments of the last session of congress and interpreted their significance to the members of the association and to employers generally. Summing up his report, he spoke of the injustice of class legislation and the necessity of educating the public to clearly understand the employers' position. Attorney Geo. F. Monaghan, of Detroit, counsel for the association, spoke upon some of the new labor laws and proposed measures and gave professional opinions upon their scope and effect upon the association members.

"Business Men to Washington" was the subject of the address of C. A. Rathbone, of the Buhl Malleable Co., Detroit. In the present congress, the speaker said, there were but seven manufacturers and 264 lawyers or 80 per cent of the total membership. In the senate, 58 out of 85 members are lawyers. Mr. Rathbone did not believe that lawyers and politicians who had no financial interest in business were the proper persons to adopt laws for manufacturers and business generally. He urged the election of business men to congress and the taking of a more active interest in politics by manufacturers. He spoke of some of the inequalities in present accident prevention and compensation laws, and said he believed that this legislation should be made to apply equally to the farmer employer who produced 45 per cent of the accidents, as well as to the manufacturer. Henry M. Leland, vice president of the Cadillac Motor Car Co., Detroit, commented upon the remarkable conditions that now prevail in this country, where, though there prevails the greatest prosperity in history, yet there is general unrest and dissatisfaction. These conditions, he says, are the result of the lack of interest of business men in politics, which unfortunately they had come to look upon with contempt. He said this was all wrong and that the business men must make their influence felt in their communities. "The gentleman who is too good or too wise to take part in politics is not fit for citizenship in this country," said Mr. Leland. F. B. Farsworth, of the McLagon Foundry Co., New Haven, Conn., also discussed the subject and presented the resolution, which was adopted, that the officers and counsel of the association continue their line of effort in opposing pernicious legislation and of rousing the public to an appreciation of the hostility toward employers shown on many sides. The general subject was also discussed by W. B. Leach, of the Hunt-Spiller Mfg. Corporation, Boston, and Chas. A. La Fever, M. Rumley Co., La Porte, Ind. Staunton B. Peck, of the Link-Belt Co., Chicago, discussed the subject "Practical Efficiency".

A most interesting and impressive address was given by Franklin H. Wentworth, of Boston, secretary of the National Fire Protective Association, upon "Fire Prevention and Fire Insurance". The speaker deplored the appalling fire waste in this country, which amounts to $3 per capita, or a total of $250,000,000 a year, compared with 33 cents per capita in Europe. The American business men are carrying this enormous fire waste and hence are at a disadvantage with their European competitors. Our present profligacy in this direction, the speaker said, arises from the idea that has become fixed in our minds that we are a country of inexhaustible resources which, until recent years, has caused us to give no thought whatever to conservation. We are now beginning to inquire into all fields for economic discipline and fire prevention is an important one. The heavy tax upon each individual in this country is not realized because it is indirect. The solution of the problem must come through impressing upon the individual, the speaker said, the responsibility for fire prevention. "We must have general appreciation that when a man causes a fire by carelessness, he practically 'picks each of our pockets'," said Mr. Wentworth. Conflagrations make scientific fire underwriting impossible and render fire insurance a gamble.

For Safety Standardization

Standardization of safety appliances for foundry employes was advocated by M. W. Alexander, member of the committee of safety and sanitation of the plants of the General Electric Co. The speaker told how this committee, in its work, had written to other employers for assistance on the methods and devices adopted for safeguarding foundry employes in the various plants. He said that the reports obtained were widely different. In the case of the use of goggles in the shop, as many replies were obtained as there are types of goggles, said the speaker. Mr. Alexander said that much of the necessarily individual investigation at present could be greatly facilitated by some standardization of the best safety appliances now in use. Acting on this suggestion, a resolution was submitted by Wm. H. Barr, Lumen Bearing Co., Buffalo, providing for the appointment of a commission by the National Founders' Association for the investigation of this subject in all its various ramifications. This resolution was adopted and President Briggs appointed the following members to constitute this board: Mr. Alexander, G. W. Mixter, Deere & Co., Moline, Ill.; E. A. Rumley, M. Rumley Co., La Porte, Ind.; Mr. Barr

and H. P. Macdonald, Snead & Co. Iron Works, Jersey City, N. J.

The Annual Banquet

At the annual banquet held Wednesday evening, C. H. Gifford, of the American Blower Co., Detroit, presided in place of Henry W. Hoyt, who was unable to attend. The speeches of the evening were by Dr. Lee McCollester, of Tufts College, on "The Business of Being a Man", and by Dr. Geo. Vincent, of the University of Minnesota, on "Democracy—Cynicism or Faith". The latter said we are a nation of catch phrases and do not believe in many cases what we say. The good in the nation predominates, however, and in the end will preserve the best institutions against the demagogue and the self-seeker. The annual alumni dinner was held on Tuesday evening and was attended by about 35.

District Committees.

The district committee elected are as follows:

First District.

Thomas W. Fry, Sullivan Machinery Co., Claremont, N. H.
A. F. Corbin, Union Manufacturing Co., New Britain, Conn.
E. A. Jones, E. D. Jones & Sons Co., Pittsfield, Mass.
D. K. Bartlett, Builders' Iron Foundry, Providence.
Dr. John A. Mead, Howe Scale Co., Rutland, Vt.

Second District.

C. A. Chase, Syracuse Chilled Plow Co., Syracuse, N. Y.
Wm. H. Barr, Lumen Bearing Co., Buffalo.
A. J. Glass, Adriance Platt & Co., Poughkeepsie, N. Y.
F. C. B. Page, E. W. Bliss Co., Brooklyn, N. Y.
Jas. Eastwood, Benjamin Eastwood Co., Paterson, N. J.

Third District.

Thomas Shipley, York Manufacturing Co., York, Pa.
Stuart R. Carr, Stuart R. Carr & Co., Baltimore.
M. Griswold Jr., Pennsylvania General Electric Co., Erie, Pa.
W. M. Gardner, Finch Mfg. Co., Scranton, Pa.
Edward Kneeland, United Engineering & Foundry Co., Pittsburgh.

Fourth District.

H. J. Boggis, Taylor & Boggis Foundry Co., Cleveland.
C. H. Gifford, American Blower Co., Detroit.
William Gilbert, Buckeye Foundry Co., Cincinnati.
E. B. Perry, Industrial Works, Bay City, Mich.
C. E. Blue, Wheeling Mold & Foundry Co., Wheeling, W. Va.

Fifth District.

Staunton B. Peck, Link-Belt Co., Chicago.
J. H. Steedman, Curtis & Co. Mfg. Co., St. Louis, Mo.
Jas. F. Lardner, Rock Island Plow Co., Rock Island, Ill.
E. E. Baker, Kewanee Boiler Co., Kewanee, Ill.
S. B. Lafferty, Red Jacket Mfg. Co., Davenport, Ia.

Sixth District.

Oliver Crosby, American Hoist & Derrick Co., St. Paul.
Theo. O. Vilter, Vilter Mfg. Co., Milwaukee, Wis.
J. L. Record, Minneapolis Steel & Machinery Co., Minneapolis.
Frederick Robinson, J. I. Case Threshing Machine Co., Racine, Wis.
J. A. Vail, Fairbanks Morse Mfg. Co., Beloit, Wis.

Seventh District.

C. H. Waterous, Waterous Engine Works Co., Ltd., Brantford, Ont.
J. A. Kilpatrick, Canada Iron Corporation, Ltd., Hamilton, Ont.
Geo. W. Watts, Canada Foundry Co., Ltd., Toronto, Ont.
Wm. Harty Jr., Canadian Locomotive Co., Ltd., Kingston, Ont.
Wm. Gartshore, McClary Mfg. Co., London, Ont.

Eighth District.

W. D. Tynes, Hardie-Tynes Mfg. Co., Birmingham, Ala.
E. Y. Hartwell, Hartwell Iron Works, Houston, Texas.
John H. McClure, Phillips & Buttorff Mfg. Co., Nashville, Tenn.
E. H. Sholar, Chattanooga Implement & Mfg. Co., Chattanooga, Tenn.
F. H. Crockard, Tenn. Coal, Iron & Railroad Co., Birmingham, Ala.

GREAT FUTURE

Predicted for Cleveland at Hearing of Ore Rate Case.

The hearing in the Youngstown Sheet & Tube Co.'s complaint against the ore rate from the lower lake ports to valley furnaces, was resumed last Thursday, at Washington, before Examiner Gerry for the Interstate Commerce Commission. James P. Orr, assistant traffic manager of the Pennsylvania Lines West, of Pittsburgh, was on the stand throughout the day. A large amount of time was devoted to the discussion of statistics and various technical matters relating to rates.

Answering questions by Mr. Gordon, the witness said that without doubt Cleveland will become the great lake ore port so far as the Pennsylvania is concerned. He said that Erie, Pa., is losing ore tonnage because large ships can save about a day by going to Cleveland instead of to Erie and proportionately to Ashtabula or other ports. He said the company has built large ore docks in Cleveland at a point where the ore carriers may go under their own power, without the aid of tugs. He said the car supply at Cleveland is always better than at other points and the haul is short and direct, especially when the shorter water haul is considered.

Mr. Orr said that there is no reason for the existence of the furnaces in the valleys other than through good railroad facilities because they no longer use the ores to be found in the valleys and their supplies of coal must be reinforced by shipments from the Pittsburgh fields. They must bring their coke from Connellsville.

The witness said the adjustment to the valleys is the result of long years of fighting and to disturb it now would throw everything out of gear again and probably force sympathetic reductions on all heavy tonnages of low grade commodities. He said he would not personally like to take the responsibility of making any change. He filed tables showing tonnage and revenues derived from it by the five divisions composing the northwest system, to show how great a tonnage would be affected by the sympathetic reductions. The revenue that would be affected by changes in ore, coal or coke rates in 1911 was $17,336,300. The tonnage affected by the decision in the Boileau case was 5,953,954, which, on the 1911 business, would have caused a loss of nearly $600,000. He said there has been no increase in lake cargo coal since the reduction, as was suggested at the time of the Boileau case.

At the hearing Friday there was a struggle between J. P. Muller, expert accountant for the complainant, and Attorney George Gordon, for the Pennsylvania lines, over the figures which the witness had put in at a prior hearing, showing, as Mr. Muller complains, that it cost the Pennsylvania lines about 20 cents a ton to carry ore from Ashtabula, O., to Youngstown, and a little more than 28 cents for the Bessemer & Lake Erie to carry it from Conneaut, O., to North Bessemer, Pa., where the ore is turned over to the Union railroad for distribution to the furnaces. Mr. Gordon's effort was directed toward showing that not only were the facts as to the number of trains on which Mr. Muller based his calculations not facts at all but that as an arithmetician Mr. Muller is not to be classed as an expert. Mr. Gordon succeeded in making Mr. Muller admit several errors, particularly that his assistant made a foolish mistake when he divided the distance between Kinsman street, Cleveland, and Hudson, O., by the distance between Kinsman street and Youngstown to get the cost per ton per mile between Kinsman street and Hudson.

MINING NEWS FROM THE IRON RANGES

Northern Pacific Dock

The Cuyuna Dock Co. was recently incorporated, as a subsidiary of the Northern Pacific railway, to construct new docks at Superior, Wis. Shipments from the Cuyuna range to date have been over a branch of the Soo line that was constructed for the purpose, terminating at a new dock in Superior. A number of properties on the range adjacent to the line of the Northern Pacific, are about ready to ship or will be by next season, and the railroad is making preparations to handle the tonnage.

The contract for the construction of the dock has been let to Siems, Cary & Co., of St. Paul, and the American Bridge Co. The latter company will furnish and erect the steel superstructure and Siems, Cary & Co. will place the concrete and piling, and will also build the approach. The approach will be about three-fourths of a mile long and will require about 5,000 piles. The dock will need about 2,000 piles, 6,000,000 feet of lumber, 5,000 tons of steel, and between 8,000 and 10,000 yards of concrete. The type of construction will be similar to that of the Great Northern dock at Allouez, and will permit of future additions. Other dock work will be done at the head of the lakes this winter, including the usual repairs, and an addition to the Soo dock at Superior.

Cuyuna Range Developments

With the approach of winter and contrary to what might be expected, active operations are not ceasing on the Cuyuna range. The Cuyuna-Duluth company has commenced work on its shaft at Ironton, the headframes are being prepared and it is expected that sinking will begin soon. The Inland Steel Co. is completing its laboratory at the Thompson mine, said to be the first company laboratory to be erected on this range. The Soo railroad is grading a spur to the Thompson mine that will permit increased shipping facilities from that property. The Rogers-Brown company is preparing a dumping ground at the No. 2 Armour mine, and expects to mine a large stockpile there this winter.

The manganese ore that is being found at several of the Cuyuna range mines is causing considerable interest. According to reports, returns were received recently by the Cuyuna-Mille Lacs Iron Co., from a shipment of five cars of such ore, that were shipped to the Lake Superior Iron & Chemical Co.'s plant at Ashland, Wis. It is said that these returns showed 31.60 per cent manganese.

The Soo line, that has aided so greatly in the development of the Cuyuna range to date, is said to have completed plans for a direct connection with the Minnesota Steel Co.'s plant, on the St. Louis river. It is expected that this will result in a considerable quantity of Cuyuna ores being used by the Steel company. It is quite likely that the location of the plant will make possible the use of low grade ore from that range, which otherwise might not find a ready market, at least at present, and if this turns out to be the case, it should mean much for the Cuyuna range.

Season Closing on Minnesota Ranges

The shipping season of 1912 is drawing to a close rapidly on the Minnesota ranges and preparations are being made for winter operations at many of the mines. The unusual activity that has marked the summer season will be manifested during the winter in continued mining and stockpiling operations at the underground properties. The Scranton mine, the largest of the state mines on the Mesabi range, will suspend ore shipments to the head of the lakes within a few days, and will begin stocking ore. This is the first season that the Scranton has been a shipper, and a large amount of ore has been handled. Probably about 300 men will be employed at the mine this winter, a much larger force than last winter. At that time, a year ago, efforts were directed toward getting the mine in readiness for shipping and mining rapidly, to take advantage of favorable market conditions when the latter should arrive. The demand for ore has increased greatly and mining will be pushed during the coming winter.

Ore shipments from Tower, on the Vermillion range, over the Duluth & Iron Range railroad will practically be discontinued in a short time. The Soudan, the principal mine at Tower, shipped 87,000 tons this year, a slight increase over last season. It is probable that underground mining and exploitation work will continue unabated during the winter, even to a greater extent than last year. This will be due to the greater demand for iron ore that has appeared during the last few months, the high grade of the ore from that range and the increase in the price of ore that will prevail in 1913. Considerable interest is being shown at Ely in some drilling operations that are being conducted about three miles west of the town. Great possibilities are generally believed to exist in this portion of the range, although no extensive or conclusive drilling has been done. For this reason the results of the work will be watched closely.

Work to be Resumed

Operations are to be resumed at an early date at the Volunteer mine on the Cascade range, in Michigan, after a period of idleness commencing in June, 1912. The mine is owned and operated by a company in which Thomas F. Cole is one of the principal stockholders. Prior to last June, work had been underway for some time, but the grade of the ore is peculiar in some respects, and the mine was closed at that time owing to the low prices prevailing for iron ore. The assurance of an increase in price has warranted the resumption of work, which will be under the supervision of Thomas Pellow, and a force of about 150 men, at the start. The mine is not far from Palmer, Mich., and the reopening of the mine will mean much to that part of the range. At the Cascade mine, in the vicinity, preparations are being made to concrete the shaft, and this work will start at a point about 50 feet below the surface.

The concentrator at the American mine on the Marquette range is being gradually adjusted and is said to be working satisfactorily. The mine will ship ore all winter, by rail to the steel works at the Canadian Soo.

Car Load of Documents Furnished by Corporation

To Its Investigators, is Hint of Mr. Reed—Hearing in Dissolution Suit at Washington Ended—Will Resume in Philadelphia or New York

The four-day session held in Washington last week by the attorneys in the suit of the government for the dissolution of the United States Steel Corporation was devoted to the examination of three witnesses. These were Luther Conant Jr., commissioner of corporations of the department of commerce and labor; Dr. Francis Walker, deputy commissioner of corporations, and Jean Paul Muller, resident partner, in Washington, of the firm of Marwick, Mitchell, Peat & Co., chartered public accountants.

The first two witnesses were questioned exclusively in connection with the report of the bureau of corporations on its investigation of the United States Steel Corporation, and the sources which were consulted in gathering the information included in this report. Mr. Muller was examined in the same manner in connection with his recent report on the cost of transporting iron ore over the Bessemer & Lake Erie, Duluth, Messabe & Northern and Duluth & Iron Range railroads. As the testimony of these witnesses was but a repetition of the statistics and alleged facts set forth in their reports, the hearings last week were unusually dull.

Last Tuesday night the opposing counsel announced that they would go to Philadelphia the following morning and take up certain aspects of the case before the circuit court of appeals. Chief of these was the testimony of Dr. Walker, which the attorneys for the Steel Corporation considered as being highly unsatisfactory. As it was learned late that night that the court was not then in session in Philadelphia, it was decided to postpone the visit to that city until Dec. 2. It is expected that the hearings will be resumed about Dec. 4 in either Philadelphia or New York.

It is the intention of counsel for the government at present to get all of its testimony into the record before the end of the year. The Steel Corporation counsel will then hold a second series of hearings, most of its witnesses to be examined in New York.

When Dr. Walker resumed, he produced a large number of tables and charts which showed the price fluctuations of various iron and steel finished products abroad. Dr. Walker testified to the authenticity of these documents, after which they were admitted as evidence. The government desired to show by these documents that the prices of the seven leading steel products have been lower in England and Germany since 1898-9 than they have been in this country; also, that prices have not fluctuated so greatly in this country since then as abroad. In cross examination, however, the witness admitted that, in 1911, prices on these products were lower here than abroad.

In reply to questioning by Mr. Lindabury, of counsel for the defense, the witness said that to his knowledge a large number of companies made money during the years 1897 and 1898. The Carnegie Steel Co., he said, made $11,500,000 profits in 1898; the Federal Steel Co. made $4,500,000 in 1898; while the Illinois Steel Co. also made several hundred thousand dollars in 1898. The Illinois Steel Co., Dr. Walker said, showed profits of about $300,000 in 1897, after paying the interest on its bonded debt.

Dr. Walker testified that conditions were very bad in the steel industry in 1896 and also in the first half of 1897. He added, however, that the second half of 1897 showed better profits than in several previous years.

"Don't you know that half the companies engaged in the steel business failed in 1897 and 1898?" asked Mr. Lindabury.

"No, I never looked into that," said Dr. Walker. He, however, was quite sure that 1898 was one of the most prosperous periods in years for the iron and steel industry.

"Judge Dickinson," continued Mr. Lindabury, "has produced a number of witnesses who testified that 1897 and 1898 were very bad years. I wonder if you have any information which was not at the disposal of the practical men who testified that?"

"I object to the question as improper examination," interrupted Judge Dickinson.

Dr. Walker, however, did not agree with the practical men referred to by Mr. Lindabury, as he continued by saying that the Tennessee Coal, Iron & Railroad Co. made over $800,000 in 1898, and the Cambria Steel Co., $626,000 in that year.

Mr. Lindabury then wanted to know if the difference between the price of pig iron and the price of manufactured steel didn't decrease during the decade 1891-1900.

"All I can say is that the difference was greater in 1899-1900 than it was in 1897-1898," said Dr. Walker. "I would not care to make a definite statement, however, without first computing the figures."

Mr. Lindabury then went over a number of price charts with the witness, calling attention to the various fluctuations. He wanted to know if these fluctuations did not indicate competition, between 1898 and 1911.

"They indicate neither one thing nor another," said Dr. Walker. "Some of the high points in the curves were brought about by strikes and a large number of prices were based on purely artificial conditions. Anyone, whether he is acquainted with the iron and steel business or not, can tell from these charts that some of the prices were fixed artificially. It is plain to be seen that those prices especially which were seldom, if ever, changed, were maintained artificially."

Mr. Muller's Testimony

Thursday, Jean Paul Muller, a certified accountant, who has frequently been referred to by previous witnesses in this case as an expert on the cost of transporting Lake Superior iron ore over the various ore railroads, was questioned at length in connection with his recent report to the Youngstown Sheet & Tube Co. on the cost of transporting iron ore over the Bessemer & Lake Erie, Duluth, Messabe & Northern and the Duluth & Iron Range railroads, during the fiscal year of 1911. Mr. Muller said that the data set forth in his report were based upon his own personal observations, upon what he has heard from shippers and upon the figures filed by these roads with the Interstate Commerce Commission. The witness then explained in detail what methods he had followed in obtaining the various figures included in the report.

For the cross examination, the witness was taken in hand by C. A. Severance, of counsel for the defense.

"Would it surprise you, Mr. Muller, to learn that the average loading of

iron and steel finished products over the Bessemer & Lake Erie is heavier than that of ore?"

"It would, very much."

"Well, such is the fact," replied Mr. Severance, who continued the examination at length. Finally, Mr. Muller said he did not claim that the figures which he arrived at, as representing the cost of transporting ore, were correct. He said they were only calculations which he had made for the purpose of submitting to the Interstate Commerce Commission.

Has Fixed System

"I have a fixed system which I apply to all roads," said Mr. Muller, "and the results I get are submitted to the Interstate Commerce Commission. This body then modifies my results by taking supplemental testimony."

"So your system is, like the laws of the Medes and Persians, unchangeable; and you do not take into account any of the local conditions characterizing each road?" asked Mr. Severance.

"Precisely. If I were to make changes each time I work on a different road, the system would have no value at all," agreed Mr. Muller.

The witness frankly admitted that his figures might be incorrect and that it might be necessary to change them after taking other testimony.

Mr. Conant's Testimony

Luther Conant Jr., commissioner of corporations of the department of commerce and labor, was examined as to the sources of information upon which certain data in the report of Herbert Knox Smith on the Steel Corporation were based. He testified that information was obtained from the New York *Times*, trade papers, the Manual of Statistics, Steel Corporation records, financial editors and other sources. He had prepared a table showing the market values of various companies taken over by the United States Steel Corporation, as indicated by the average monthly security prices, from 1899 to 1900. "The value of the Carnegie Steel Co. securities was very hard to obtain," said Mr. Conant, "as they were very inactive. Only 13 shares of the Carnegie stock were sold on the Pittsburgh stock exchange. They were sold at $1,000 a share."

"Following the acquisition of the Lake Superior Consolidated Iron Mines, what percentage of the Steel Corporation's ore property was held under leases?" asked Mr. Colton.

"Well, over 50 per cent was lease held," answered Mr. Conant.

"What was the total book investment of the subsidiaries of the United States Steel Corporation in improvements on mining properties as of May, 1901?"

"It was $9,000,000." Mr. Conant said this amount was invested in stripping shovels and ordinary improvements, such as buildings, machinery, shafts, etc.

The par value of the Duluth, Messabe & Northern railroad's capital stock in 1901, said Mr. Conant, was $2,512,000, while $7,765,000 worth of bonds were outstanding. The par value of the Lake Superior Iron Mines' capital stock was $2,305,000.

"Did the Steel Corporation furnish you with a detailed statement showing the value of its manufacturing properties as of Jan. 1, 1908?" asked Mr. Colton.

"Yes, $382,316,021. This was exclusive of the Tennessee Coal, Iron & Railroad Co."

Mr. Conant's entire testimony, including Herbert Knox Smith's report, was objected to by David Reed Jr., counsel for the Steel Corporation, on the ground that it was based in part at least on hearsay and for other reasons was not admissible.

Carload of Documents

In cross examination by Mr. Reed, the witness said that the investigation of the Steel Corporation by the bureau of corporations was begun in 1905 under Commissioner Garfield, continued under Commissioner Smith and is still being continued under Mr. Conant, who has acted as commissioner for only a few months. The sources consulted by the bureau for its information, said the witness, are the reliable trade papers and the Steel Corporation itself, in the main.

"Is it not true that the Steel Corporation has furnished over a carload of documents for the use of the bureau?" asked Mr. Reed.

"I could not say."

"Have you always found that the Steel Corporation is willing to supply you with information that you call for?"

"I would say that it is as a general rule. There are several instances, however, in which the Steel Corporation has not furnished us with information we asked for."

"Were your requests of such a nature as to cause you to believe that the Steel Corporation was in a position to give you this information?"

"Yes, from the nature of our correspondence with the Corporation I was led to believe that it was in a position to supply the information asked for."

IMPROVING PLANT

Mesta Machine Co. Making Additions At West Homestead, Pa.

The Mesta Machine Co., Pittsburgh, has undertaken rather extensive improvements which will add greatly to the attractiveness of its plant at West Homestead, Pa. Under the supervision of J. Edward Keirn, architect, who built the entire plant at West Homestead, the Mesta company is building a three-story, 53 x 41-foot addition connecting the administration building with the main plant and is also erecting an attractive waiting station for the convenience of employes using the trolley line.

An overhead 12-foot wide bridge will extend from the station to the center of the new addition, making it unnecessary for officers and employes to cross the half dozen tracks of the Pennsylvania railroad. The railroad soon will start work on a station from which a wide stairway will lead to the overhead bridge.

The new addition will make it possible to enlarge the drafting rooms and will also afford additional space for administration offices. A spacious reception room will be provided on the second floor, directly opposite the private office of the superintendent. Surmounting the addition will be an illuminated 6-foot clock. Work will be completed January 1.

Chemical Engineers Program

The official program has been announced for the fifth annual meeting of the American Institute of Chemical Engineers, to be held at the Hotel Cadillac, Detroit, Dec. 4 to 7. Among the papers to be presented are an address on "Availability of Blast Furnace Slag as a Material for Making Brick", by Prof. A. E. White; "The Chemical Engineering Laboratory of Columbia University", by Prof. M. C. Whittaker, and numerous other subjects pertaining to chemical engineering. A number of visits to industrial plants in the vicinity of Detroit will be made, including those to the Ford Motor Co., Pennsylvania Salt Mfg. Co., Michigan Malleable Co., Detroit Copper & Brass Rolling Mills, Detroit Sulphite Fiber Co., Park, Davis & Co., Berry Bros., Ltd. On Friday, an excursion to Ann Arbor to visit the University of Michigan will be made.

CAMPAIGN OF EDUCATION

For Prevention of Accidents by Metal Trades Association.

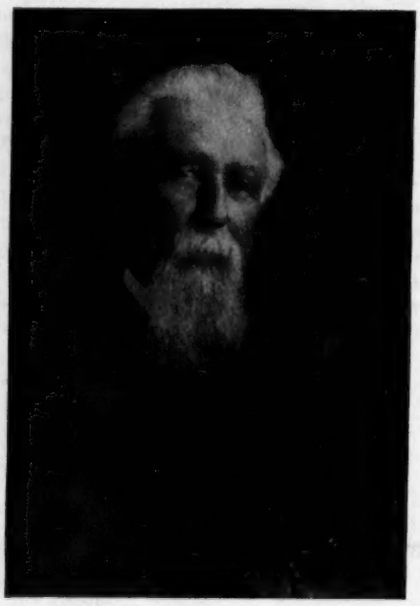
Probably no other organization is taking such an active interest in the prevention of industrial accidents as the National Metal Trades Association. Through its factory inspector, William H. Doolittle, of Cleveland, and its allied branches in many of the large cities throughout the country, it is conducting a campaign of education along this line, and the results to date are such as to warrant steady continuation. Mr. Doolittle spends considerable time in traveling and inspecting shops of members of the association, criticising current practice and suggesting the application of safety devices where they appear to be needed. Illustrated lectures form part of the work, and for this purpose moving pictures are used to good advantage. Such a lecture was given by him recently in Cincinnati, and the attendance of 3,500 showed that much interest is being taken in the work. A few nights later a similar lecture was given at the Hollenden Hotel in Cleveland, at which a moving picture play was given, in which was shown graphically the dangers surrounding moving machinery and the necessity for covering such parts with guards.

The safety devices advocated by the association include a great number of appliances for use on machinery in foundries, machine shops and pattern shops, such as planers, band saws, circular saws, etc. The proper regulation of engine speeds is also of great importance in this connection. The racing of an engine frequently leads to what is known as the bursting of a flywheel. A recent accident of this sort caused a property loss of $135,000 and the death of two men. In 107 accidents of this kind in one year, the total property loss was $2,000,000 and 117 men were killed and 65 injured. A device that prevents engine racing, therefore, means much.

Much difficulty is encountered in training men to use the various safety appliances. The older men that have been trained to use machines without guards, are particularly hard to educate and in some instances their influence is detrimental to the younger men around them. Co-operation is needed between the men in the shops and those interested in their behalf, and in many cases this can be brought about only by the men themselves. In one state at least, it is illegal for certain machines to be operated without guards, and illegal also for an operator to remove any guard placed on a machine. There seems to be no doubt, however, as to the ultimate success of the safety movement, and this, coupled with the changes in compensation laws that are being wrought, are tending to make the life of the mechanic safer than it ever was before.

OBITUARIES

Isaac Porter Lamson, president of the Lamson & Sessions Co., bolt manufacturer, Cleveland, died Nov. 20 at his home in Cleveland, after a month's illness from hardening of the arteries. Mr. Lamson was born Sept. 2, 1832, at Mt. Washington, Mass. He worked for several years in bolt factories in Southington, Plantville and Milldale, Conn. In 1868 he joined his brother, Thomas H. Lamson, and Samuel W.



THE LATE ISAAC P. LAMSON

Sessions, in establishing the Lamson & Sessions Co., at Mt. Carmel, Conn. The following year the business was moved to Cleveland. Mr. Lamson was a director in the Ferry Cap & Set Screw Co., the Union National bank and the Union Rolling Mill Co.

Horace Patterson, son of George Lyman Patterson, iron operator of Pottsville, Pa., who was the founder of Mahoney City, Pa., died last week, at Grafton, Pa., aged 57 years. He was the proprietor of the Paradise Foundries, in Huntington county, Pa.

William T. Goss, one of the inventors of the Goss printing press and one of the best known manufacturers in the country, died of acute appendicitis in Chicago, last week, after a few days' illness. He was a native of England, but had lived in this country since he was three years old. With his two brothers, F. L. and S. G. Goss, he worked for many years to invent a practical printing press. Mr. Goss was 63 years old.

Elijah J. Lyon, who was for many years superintendent of the foundry of the Brown & Sharpe Mfg. Co., Providence, R. I., by which concern he was employed for 55 years, died Nov. 22, at his home in that city, after an illness of five years. He was 80 years old.

Arthur C. Scott, who had represented the Norton Co., Worcester, Mass., in Great Britain, for the past three years, with headquarters in London, died Nov. 22, of heart disease. He was 42 years of age and was born in Northbridge, Mass. He had been connected with the Norton Co. for 10 years, formerly covering New York and Connecticut territory.

William N. Hobart, aged 76 years, president of the Triumph Electric & Ice Machine Co., Oakley, Cincinnati, died at his home in Walnut Hills, that city, recently, death being due to a complication of diseases. Besides the above named position, Mr. Hobart was also a director of the William S. Merrill Chemical Co., Cincinnati, and an ex-president of the Cincinnati Chamber of Commerce. He was also connected with several large liquor interests, and had been in business in Cincinnati for over 55 years.

Gen. Robert W. Healy, who had been president of the Ross-Meehan Foundry Co. for the past 20 years, died recently at his home in Chattanooga, Tenn. His death is believed to have resulted from heart failure, following an acute attack of grip. Gen. Healy was born in Chicago Oct. 22, 1836. He received his degree of bachelor of arts at the University of Notre Dame, in 1859, his A. M. degree in 1865 and LL.D in 1908. In 1861 he enlisted in the Fifty-eighth Illinois infantry, being later promoted to the rank of captain. Subsequently he served as major, lieutenant colonel and brigadier general, holding the last named title when he received his honorable discharge in 1866. After the war, General Healy settled in Alabama, and became interested in the cotton planting industry. Later he became the purchasing agent of the Erlanger system, operating the Queen & Crescent lines of railway, serving in this capacity until 1892, when he became president of the Ross-Meehan Foundry Co. He had filled many official positions, each of which was marked with faithful service.

LATEST MACHINERY NEWS COLLECTED IN LEADING MANUFACTURING CENTERS

In New York, machinery business continues to hold up to a satisfactory volume. Both orders and inquiries during the past week have been good and reflect confidence on the part of machinery users in a steady expansion in general business. The New York, New Haven & Hartford railroad has placed all the orders for the equipment inquiries issued some time ago for the shops at Readville, Mass. The expenditure amounted to about $60,000, all of which, with the exception of a very small portion, went to one New York dealer. The week's total of business is largely the result of numerous small lot orders, however, and these were well distributed. The most important list of specifications received in the machine tool trade was sent out by the National Transcontinental Railway of Canada. The list includes 37 units, which will be distributed among five of the company's shops.

In Pittsburgh, an expression is heard among the machine tool builders that the trade is experiencing somewhat of a lull. The larger buyers are figuring on 1913 equipment and it is not probable that heavy buying will characterize the market until after appropriations are allowed. A number of industrial plants are making extensions and several new concerns have entered the market for miscellaneous equipment. The Weirton Steel Co., Weirton, W. Va., recently organized, is negotiating for a 30-ton crane and will buy rather heavily, it is expected, in the near future. Two or three large shears are involved in pending transactions and several inquiries for lathes have not yet been closed. Second hand machinery has been moving at a fairly good rate.

In Cleveland, a widely divergent view of business conditions is taken by dealers in shop equipment. One dealer stated that the volume of business transacted during the week was satisfactory and well in line with the amount done before the election. Another dealer, however, stated that no inquiries of any size had been received since election, and from information gathered throughout that district, he felt confident manufacturers were holding off plant improvements until the attitude of the president-elect, as well as the probable course of the new congress in its extra session, shall be better established. Business done during the week was confined largely to lots of single tools.

In Cincinnati, radial drills have been the best sellers for the past two weeks. Most of the orders have been placed in foreign territory, although the domestic demand has increased to a large extent. Export business is better than it was last month with a number of the plants, but domestic trade has fallen off a little. Railroad buying has been rather slow throughout November, but it is expected that it will improve before the first of the year. Lathes are probably second in importance in the selling line with planers a close third. Makers of small electrical equipment and also of gas engines are enjoying a fairly good business, and conditions in the second hand machinery trade have improved a little within the past two or three weeks.

Machine Tools

The following list of machine shop equipment for the shops of the National Transcontinental Railway of Canada, Ottawa, Ont., has been received by New York machinery dealers, and is in addition to the list sent out several weeks ago:

One 28-inch x 16-foot motor driven gap lathe.
One 14-inch portable motor driven bolt turning lathe.
One 16-inch motor driven crank shaper.
One 20-inch motor driven vertical back geared drill.
One single bolt cutter.
One motor driven pipe machine.
One 6-inch by 36-inch grindstone.
One double emery grinder.
One 60-inch circular up-draft forge.
One electric forge blower.
One 40-pound anvil.
One 80-inch motor driven wheel lathe.
One 28-inch by 16-inch motor driven gap lathe.
One 20-inch by 10-foot motor driven double back geared engine lathe.
One 10-inch by 8-foot motor-driven high speed double back geared engine lathe.
One 30-inch by 30-inch by 8-foot motor-driven planer.
One 4-foot motor-driven radial drill.
One 20-inch motor driven vertical back geared drill.
One 16-inch motor driven crank shaper.
One motor driven pipe machine.
One single bolt cutter.
One motor driven combined punch and shear.
One 500-pound self contained power hammer.
One 6-inch by 36-inch grindstone.
One double emery grinder.
One 30-inch motor driven band saw.
One 24-inch by 9-foot motor driven wood pony planer.
One 50-pound portable forcing press.
One 14-inch portable motor driven bolt turning lathe.
Two 60-inch circular up-draft forges.
Two electric forge blowers.
One 3-ton portable crane.
Two 400-pound anvils.
One 6-ton crane.

New Construction

The Star Drilling Machine Co., Akron, O., advises that it is building a branch plant at Long Beach, Cal.

The American Pin Co., Waterville, Conn., is to erect a one-story office building of brick, with granite trimmings, 52 x 55 feet.

The Petroleum Iron Works Co., Sharon, Pa., is preparing to build a two-story brick addition, 20 x 52 feet, to its office.

A frame store room to contain raw materials is being erected by the S. M. Jones Co., Toledo, O., manufacturer of engines.

The Pittsburgh Valve & Fittings Co., Barberton, O., plans to build a 160 x 144-foot addition to its works at that city.

The Universal Wheel Co., Ft. Wayne, Ind., has awarded the contract for a plant it proposes to erect in that city. It has three sites under consideraion.

A foundry will be erected by the Chadwick Brass Co., Ltd., Hamilton, Can., for manufacturing brass, aluminum and bronze castings. The company makes brass and metal goods.

The Universal Caster & Foundry Co., 574 Ferry street, Newark, N. J., will make alterations to its plant which will increase the present capacity.

The Davies Threshing Machine Co., Oshkosh, Wis., advises that it is not yet in position to give out information relative to its new buildings and equipment.

The New Britain (Conn.) Machine

Co. is to add a blacksmithing department to its plant. It will erect a brick building, 86 x 39 feet, with steel and concrete roof.

The Co-operative Motor & Marine Co., organized at Greenwood, S. C., by Winfield S. Thorne and others, with a capital stock of $5,000, will erect a small machine shop.

C. H. Berryman, Lexington, Ky., will build and equip on East Main street, that city, a large garage and automobile machine shop, which will be run by O. R. Hukle, an expert automobile repair man.

A 30 x 40-foot boiler house addition to the power plant of the Burton Powder Co.'s plant near New Castle, Pa., has been planned by Sidney B. Martin, consulting engineer, Penn building, Pittsburgh.

The American Brass Co., Waterbury, Conn., is to erect a tube mill at the Benedict & Burnham plant in south Main street, that city. The structure will be of brick and steel, 199 x 224 feet, one story.

Solf & Stellch, Neillsville, Wis., have purchased a tract of land in that city and intend to erect a plant for the manufacture of tools and machinery for blacksmith and forging shops.

The Fisher Machine Works Co., Leavenworth, Kan., has begun the work of rebuilding a foundry, following a fire which recently damaged the company's plant and patterns. The loss was partially covered by insurance.

The L. A. Norris Co., manufacturer and wholesaler of reinforcing steel for fireproof buildings, has bought a lot containing 40,000 square feet in San Francisco on which it will build a factory and warehouse.

The Superior Steel Co., Carnegie, Pa., will build a 40 x 60-foot extension to its main building and a 100-foot crane runway with a 90-foot span. This contract was placed with the McClintic-Marshall Construction Co., Pittsburgh.

The Massey Harris Co., Toronto, Can., agricultural implement manufacturer, has purchased a site on the corner of Sixth street and Peace avenue, at Edmonton, Alta., on which it will erect a large warehouse five stories in height.

A. L. Pachoud, Cincinnati, has purchased a tract on Montgomery avenue, that city, upon which he will erect a large automobile garage and machine shop. Architects Joseph G. Steinkamp & Bro. have the plans in charge.

The Milton Bradley Co., manufacturer of toys, games, desks, chairs, etc., in Springfield, Mass., is erecting a large addition to its plant. The new structure will be of brick, mill construction, 60 x 124 feet, six stories with basement, and will cost $55,000.

The Pennsylvania Fireproofing Co. is making extensive improvements at its plant near St. Marys, Pa., which will entail an expenditure of nearly $100,000. Modern machinery and electrical devices are being installed, and 25 new kilns are being built.

The Seltzer Bennett Co., Newark, N. J., has taken out a permit to construct a fertilizer manufacturing plant on the Newark Meadows. The buildings, under construction at present, are estimated to cost about $10,000 and it is said that additional ones will be erected later.

The Abram Cox Stove Co., Philadelphia, whose plant was damaged by fire recently, advises that it will repair and rebuild at once. It estimates the loss at between $100,000 and $200,000, fully covered by insurance. No additional machinery will be required, as the fire was principally confined to the warehouses.

New shops will be built by the Chicago Bearing Metal Co., Chicago, on a site of 8½ acres recently secured on Western avenue, that city. The capacity will be greatly increased. The company recently increased its capital stock from $500,000 to $1,000,000, and part of this increase will be used in erecting the new shop.

Plans have been prepared for an addition to the factory of the Irvington Mfg. Co., manufacturer of forged tools, on High street, Irvington, N. J. The building will be one story, 64 x 130 feet, and is estimated to cost $10,000. Fred A. Phelps, Union building, Newark, is the architect.

A branch factory of the Everitt Motor Co., Detroit, will be established at Windsor, Can. The plant will be erected by the Tudhope Automobile Mfg. Co. It will cost $100,000 and will occupy a 10-acre site. Building operations will commence in April of next year.

Contracts have been let by the Crucible Steel Co. of America, Pittsburgh, for the erection of a one-story, brick, 45 x 140-foot warehouse, at Indianapolis. The estimated cost is $10,000. C. W. Mayer is manager of the sales branch of the company, at 212-214 South Pennsylvania street, Indianapolis.

The Weirton Steel Co., Weirton, W. Va., through the United Engineering & Foundry Co., Pittsburgh, has completed plans for a new hot and cold rolled steel plant at Weirton. The McClintic-Marshall Construction Co., Pittsburgh, has taken the contracts for a mill building 200 x 300 feet, and annealing building 50 x 150 feet, a pickling building, 50 x 150 feet, a machine shop 40 x 60 feet and a gas producer 40 x 70 feet. About 600 tons of steel are involved.

Power Plant Equipment

The Hercules Plaster Board Co., Hampton, Va., wants prices on a 25-horsepower fire-box boiler.

The details of the Corydon, Ky., bond issue of $8,000 for an electric light plant are being arranged, after which the contract for the construction of the plant will be let.

Two new boilers and a new high power steam engine are included in the machinery which the Washington Mill Co., Spokane, Wash., contemplates adding to its plant. A new warehouse may also be built.

The Louisville Lighting Co., Louisville, Ky., will probably install additional power units in its plant during 1913. No immediate purchases of machinery will be made at this time, however. Wilbur Hubley is chief engineer.

The Cincinnati Mailing Device Co., Cincinnati, manufacturer of mailing tubes and similar goods, has acquired property adjoining its present plant, and will more than double its capacity. It will require considerable power machinery and special equipment for this purpose.

Power machinery will be required for a $700,000 cotton mill to be constructed at Sylacauga, Ala., by ex-Governor Comer, of Alabama, and associates. The spindles will number 30,000 to 40,000 and the looms 800 to 1,000. J. E. Sirrine, Greenville, S. C., is the architect.

New Buyers

A company capitalized at $50,000 has been organized at Evansville, Ind., by J. R. Goodwin, W. C. Goodwin and P. E. Goodwin, to manufacture steel scaffolding

Railway appliances will be manufactured by Allen's Nut Lock Co., Chicago, recently incorporated with a capital stock of $500,000. The incorporators are A. J. O'Donnell, R. J. Maroy and O. Allen Jr.

The Fillow Auto Co., Danbury, Conn., recently incorporated, advises that it will deal in automobile accessories. The company is building a show and salesroom, and, having been in business 10 years, has all the necessary equipment.

The Phoenix Automobile & Trunk Co., Ltd., has been incorporated at Ottawa by Joseph George Charrier, Stanislaus Bordeleau, Alexandrex Bor-

deleau, Napoleon DeGrandmont and Emile Albert Brodcur, all of Montreal, Que., to manufacture and deal in automobiles, bicycles, motors, engines, conveyances and machinery. It will have a capital stock of $50,000.

Cork and leather insert polishing wheels will comprise the output for the present of the Cork-Insert Abrasive Wheel Co., Inc., Manhattan, New York City, recently incorporated. Patents have been granted to the company, whose officers follow: President, John C. Blevney; vice president and sales manager, Russell Whitcomb; secretary and treasurer, George C. Luebbers. The manufacturing will be done at Newark, N. J., and the output will be limited only by the demand.

The New Castle Steel & Iron Co., New Castle, Pa., recently organized, has closed negotiations for the plant and property of the New Castle Forge & Bolt Co., that city. Pittsburgh capital is largely interested in the new company. W. H. Schoen, Pittsburgh financier, is president of the Steel & Iron company; A. B. Berger, connected with a number of Pittsburgh financial interests, is treasurer; E. H. Brainard, identified with the Nicola interests, is secretary; E. G. Caughey, until recently connected with the American Car & Foundry Co. at Huntington, W. Va., is manager of works and with J. D. Rhodes, a Pittsburgh manufacturer, and E. H. Ohl, these men comprise the directorate. The Forge & Bolt Co.'s works will be converted into a plant for the manufacture of steel cars. Offices of the new company are in the Farmers Bank building, Pittsburgh.

New Incorporations

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

The following manufacturing companies have filed articles of incorporation:

The Victor Brass Mfg. Co., Cleveland, O.; $25,000; M. L. Tonne, W. J. Mahon, A. N. Fiebach, T. B. Bolton, F. M. Pelton.

The Grover Rotary Engine & Pump Co., Laduc, Mo.; $8,000; incorporators, David C. Bramell, W. S. Mitchell, E. H. Turk, and others.

The Interstate Metal Cornice Co., Jersey City, N. J.; $10,000; tinsmiths; incorporators, Isaac Nesselowitz, Hyman Eckstein and Ida Nesselowitz.

The Willeys-Overland Co., Toledo, O.; automobiles and other vehicles, boats, etc., and parts thereof, fittings, machinery, dynamos, etc., used in connection therewith; $250,000, $200,000 common of $100, $50,000 preferred of $100; Walter Stewart, Isaac Kinsey, Royal R. Scott, A. H. Smith and G. W. Hennett.

Scharf Gearless Motor Car Co., Richwood, O.; $5,000; George W. Worden, John A. Scharf, W. H. Siples, E. E. Payne, L. J. McCoy.

Vacuum Clothes Washer Co., Cleveland; $10,000; Frederick W. McLean, Edward C. Kollirath, Charles L. Nelson, Chas. E. Carpenter, C. T. Kirkbride.

Universal Wrench Co., Newark, N. J.; $500,000; manufacture wrenches; incorporators, Russell D. Clancy, Ransom Y. Boyee and Alva A. Brown.

Chelsea Mfg. Co., Jersey City, N. J.; $2,000; manufacturing plumbing supplies; incorporators, Harry Edwards, William H. Barnett and Harry T. Letts.

A. Beauvais Water Heater Co., Holyoke, Mass.; $200,000; incorporators, John B. Beauvais, George C. Robert, Arlan M. Spencer, Joseph H. Beauvais and E. E. Beauvais.

The United States Molding Machine Co., Cleveland, O.; foundry molding equipment; $10,000; J. M. Battenfeld, James H. Briswold, George H. Williams, Willis E. White and John A. Hadden.

The Air-Vac Washer Co, Columbus, O., manufacturing of Air-Vac washer; $10,000; David S. Beverly, C. Fred Beverly, George W. Campbell, Horace W. Campbell and David T. Ramsey.

The Malleable Furnace & Mfg. Co., Cleveland; manufacture of heating apparatus; $10,000, 100 shares of $100; William Wynn, A. H. Nicholl, William Kennedy, Mildred M. Nicholl, Daisy M. Wynn.

Pequot Brass Foundry, Norwich, Conn.; to manufacture brass and other metals; $6,500; Frank E. Green, Edwin A. Tracy and Frank M. Green; the first-named has been elected president and the second secretary and treasurer.

General Industrial

The Southwestern Iron Works, Guthrie, Okla., has been declared bankrupt.

The Chandler Iron Co., Duluth, Minn., has filed a petition for dissolution.

The No-Pack Brass Mfg. Co., Clearfield, Pa., has increased its capital stock from $100,000 to $200,000.

The Belle City Malleable Iron Co., Racine, Wis., is increasing its capital stock from $75,000 to $500,000.

The mills of the Penn Iron Co., Ltd., Lancaster, Pa., closed for nearly two years, are being repaired with a view to operating them soon.

The Cleveland-Galion Motor Truck Co., Galion, O., has increased its capital stock from $300,000 to $1,000,000.

The New Departure Mfg. Co., Bristol, Conn., is negotiating for the purchase of the Whitlock Coil Pipe Co.'s business in Hartford.

The Woodstock (Ont.) Automobile Mfg. Co. Ltd., which obtained a free site from the city, has made an assignment.

The Kottusch Patent Pulley Mfg. Co., Chicago, has been incorporated with a capital stock of $75,000. The incorporators are Emil Kottusch, Emil Schmidt and W. J. Stewart Hyde.

The Pratt & Letchworth Co., Buffalo, is increasing its capital stock from $800,000 to $2,400,000. J. C. Bradley is the president and general manager of the company.

The Northey Mfg. Co., Waterloo, Ia., has purchased the equipment of the Savage Ice Making Machine Co., Freeport, Ill., and moved it to Waterloo, and will manufacture ice making machinery.

The Duplex Metals Co., Chester, Pa., is doubling the capacity of its plant. Eleven new furnaces are being installed and the company expects hereafter to be able to put on the market, annually 50,000,000 pounds of copper-clad steel wire.

The Pratt Malleable Iron Co., Joliet, Ill., has been given a contract to manufacture a newly patented corn planter, which eliminates the use of wire for dropping the seed. The patent was obtained by C. W. Lenham, Shelbyville, Ill.

A remarkable scarcity of furnaces and heating systems is reported by Ottawa, Ont., architects, and is a condition said to be general all over Canada at the present time. The extent of building going on in the country is understood to be the reason for the delay in the delivery and difficulty in securing the heaters.

United States Commissioner Watkins, in the case of the Trust Co. of America against the Chattanooga Iron & Coal Co., Chattanooga, Tenn., has sold the entire property of the Chattanooga Iron & Coal Co. to Alexander W. Chambliss, representing the bondholders' reorganization committee and the Equitable Trust Co., of New York, for $500,000.

The King Machine Co., Bridgeport, Conn., recently incorporated, advises that it is engaged in making automatic corset ironing machines and the King silent tumbling barrels. Its officers are: President, J. T. King; vice president, F. E. Warner; secretary, E.

E. Norton; treasurer, W. P. Allen. The officers are also acting as directors.

President F. H. Eaton, of the American Car & Foundry Co., has made the following statement: "Fire at the Terre Haute plant destroyed one of the shafts and will affect actual construction of cars for only a couple of weeks. The loss was less than $49,000, fully covered by insurance. The building will be rebuilt immediately."

The Zetterman Machinery Co., Boston, advising in regard to its organization, says that it does not intend to manufacture anything, but will act as agent for manufacturers of engines, boilers, motors and metal and woodworking tools. The company is desirous of securing any desirable agency in the New England territory.

Charles Morse, receiver for the Montpelier Cup & Metal Works, Montpelier, Ind., has been ordered by the Blackford county circuit court to sell the property and business of the company. Assets are about $30,000, with liabilities of about $70,000. The receiver reports that the plant has been operated under the receivership at a loss.

The Lake Superior Iron & Chemical Co. is considering the construction of a chemical works at its Chocolay furnace at Marquette, Mich. The projected plant will cost approximately $200,000, and will be similar to the wood distillation works erected last year at Newberry, Mich. The Chocolay furnace has been idle ever since it was purchased by the company several years ago.

The Belle City Malleable Iron Co., Racine, Wis., has increased its capital stock from $125,000 to $500,000 to provide for the expansion of the business, under plans now being formulated. John H. Dwight, vice president and general manager, says that the plans have not yet reached the definite stage when announcement can be made. J. A. Chapman, Chicago, is president, and H. E. Williams, Racine, is secretary and treasurer.

The Francis Reed Co., Worcester, Mass., has sold its planer chuck business to the Skinner Chuck Co., New Britain, Conn., which has moved the stock and patterns to its own plant. The Reed company has manufactured the Jordan planer chuck for about 20 years, in connection with its line of drills, upon which it now intends to specialize. The officers of the Skinner company are: President, David N. Camp; vice president and treasurer, Daniel O. Rogers; secretary and assistant treasurer, Edward J. Skinner.

Referee in Bankruptcy Kirk E. Wicks has declared a 25 per cent dividend in favor of creditors of the Muskegon Steel Castings Co., Muskegon, Mich., recently reorganized as the Western Michigan Steel Foundry Co. It is expected that creditors will eventually obtain from 60 to 75 per cent of their claims. J. George Shaw, president of the Milwaukee Steel Foundry Co., has acquired an interest in the Western Michigan Steel Foundry Co., which will be under his general supervision. It expects to begin operating this week.

The Maxim Silencer Co., Hartford, Conn., has been organized with a capitalization of $50,000 to engage in the manufacture of a new silencer for motorboats that has been invented by Hiram Percy Maxim, of the Maxim Firearms Silencer. The officers of the company are: President, E. Kent Hulbard Jr., of Middletown; treasurer, Arthur L. Shipman, of Hartford; mechanical engineer, Hiram Percy Maxim. The company plans to eventually produce silencers for motorcycles, stationary engines, rock drills, locomotive safety valves, and similar noise-producing machinery.

Trade Notes

The American Metal Fastener is the new name adopted by the Wolfe-Craig Co., Chicago.

Thomas L. Banett, Louisville, Ky., a dealer in contractors' machinery, has sold a number of hoists of the Clyde Iron Works to the Falls City Construction Co., of Louisville.

The Henry Vogt Machine Co., Louisville, Ky., reports the sale of a 100-horsepower boiler to the W. H. Gillette Mfg. Co., a wood-working concern, Louisville.

J. F. Wagner's Sons, Louisville, Ky., manufacturer of metal doors, windows, etc., have installed two additional drill presses in their local plant.

Arrangements have been made by the Michigan Wheel Co., Grand Rapids, Mich., to increase its list of foreign distributing agencies by locating branches in Russia, Norway, Sweden and France.

The Hamilton Hardware Corporation, Hartford, Conn., is negotiating for the purchase of the building occupied by it under lease at 94 Bank street. The property is valued at about $75,000.

The H. W. Johns-Manville Co. has recently opened a new southern warehouse at No. 31½ South Broad street, Atlanta, Ga., which will be utilized exclusively as a warehouse for a stock of J-M. products of numerous kinds. Location of the new site will materially help to minimize the chance of delay of deliveries.

Miscellaneous

The commissioners of the District of Columbia will take bids Dec. 6, for 835 tons of cast iron pipe for use in the water department of that city.

Beare Bros., Jackson, Tenn., are in the market for electric motors and ice-conveying machinery for their ice and electric plant at that point.

Woodworking and special machinery will be required in the proposed rebuilding of the Germania Cedar Works, Christiana, Tenn., which plant was destroyed by fire some time ago.

Plans are being considered by the Louisville Water Co., Louisville, Ky., for installing an additional filtering process at its plant, to be used in connection with one already in operation. The filter, which is estimated to cost about $300,000, will increase the capacity from 30,000,000 gallons a day to 70,000,000 gallons.

The National Iron & Steel Co., Houston, Tex., has purchased from the Toledo, St. Louis & Western railway some 3,500 tons of relaying and rerolling steel rails. The relaying rails are 70-pound sections, and are being delivered to the purchaser at East St. Louis, Ill., for shipment to the west and southwest. The National company advises that it is very probable that it will, at an early date, establish an office at St. Louis, with its vice president, I. H. Cohn, in charge. This firm does an extensive business in new and relaying rails, and also track accessories and iron and steel products.

Fires

The plant of the Filer & Stowell Co., Milwaukee, Wis., was damaged to the extent of $500 by fire, recently.

The erecting plant of the American Car & Foundry Co., Terre Haute, Ind., was badly damaged by fire last week, the loss being estimated at $50,000. The bursting of an oil main leading to a riveting furnace caused the flames to spread rapidly.

The plant of the Art Brass & Plating Co., Louisville, Ky., was damaged somewhat by fire last week. The damaged equipment will be repaired, and members of the concern state that no additional machinery will be needed. Rademaker & Shade, a brass-finishing concern in an adjoining building, also suffered somewhat from the fire.